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GROWTH IN INTELLIGENCE UNDER DIFFERING SCHOOL ENVIRONMENTS

by
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Substantial gains in intelligence by children who have attended the preschool laboratories of the Iowa Child Welfare Research Station and the elementary and junior high schools maintained by the College of Education of the State University of Iowa were demonstrated by the writer (6, 7) in two articles published in 1932. The children had been repeatedly examined on individual Binet tests over periods of three to nine years. During the preschool ages the gains were directly associated with periods of preschool attendance. Significant gains were made over the academic year when the children were enrolled in preschool; over the summer months there was no gain. Further, the gains were associated with amount of attendance within the limits of the academic year.

CHANGES IN IQ OF TRANSFER GROUP

The aim of the present study was to probe further into the causes of these rather remarkable gains by studying growth in intelligence of school age children who were attending other schools and of preschool age children who were not attending preschool. For the first part of the study seventy-seven children who at one time had been enrolled in the preschools or elementary schools of the University system but who had left for other schools were retested while in the other schools. This group is designated as the transfer group. All testing was done by research assistants in the Iowa Child Welfare Research Station.[1]

Table I shows the mean IQ and age on the initial test and on the test made after transfer. The initial test was given near the time of entrance to preschool or elementary school. The ages of the children on initial test ranged from twenty-four to seventy-two months, with a mean of 48.2. Their ages at the test after transfer ranged from sixty-nine to one hundred seventy-two months, with a mean of 108.6. It will be seen that an interval of five years had elapsed between the initial test and the test after transfer and that at the time of the test after transfer the children had had on the average 4.4 tests. Prior to transfer they had had 3.4 tests. It will also be seen that there had been a gain in IQ of 9.3 points. Table II shows that there is practical certainty of a true difference between the two means of IQ, since the ratio of the difference to the standard deviation of the difference is 3.36. How much of this gain took place during the period of enrollment in the University system and how much after transfer can be answered by showing the gain up to time of transfer.

Sixty-one children had had more than one test prior to leaving the University system; the other sixteen had had only one test. The number of tests up to the end of unbroken enrollment in the University system was

1. The writer wishes to thank the staff members of the College of Education of the University and the superintendents and principals of the other schools for permission to test the children during school hours.

distributed as follows:

Tests	Children
2	22
3	8
4	17
5	6
6	5
7	2
8	1

A few children had had more tests than this prior to transfer, but the additional tests covered irregular enrollment. Regularity of enrollment was considered by year grouping units.

The mean IQ of the sixty-one children on the initial test, on the last test representing continuous enrollment in the University system, and on the test after transfer are given in Table I. The gain made from the initial test to the test after transfer (9.7 points) was practically the same as for the whole group of seventy-seven children. The critical ratio of 3.50 (Table II) indicates practical certainty of a true difference. However, the major gain, 8.6 points, was made in the eighteen months of attendance in the University system, and no real increment was added in the forty-five months thereafter. The gain from the last test prior to transfer to the test after transfer was 1.1 points, with a critical ratio of 0.35 showing only 64 chances in 100 of a real difference. The preceding gain before transfer shows a critical ratio of 2.91 or 99.8 chances in 100 of a real difference. The changes are shown in Figure 1.

The distribution of IQ's on the three tests is shown in the following tabulation and in Figure 2. The two latter distributions are very similar in form. They differ from the distribution on initial test mainly in that the mode has shifted from the 100-109 to the 110-119 grouping and the whole distribution has advanced one level.

TABLE I

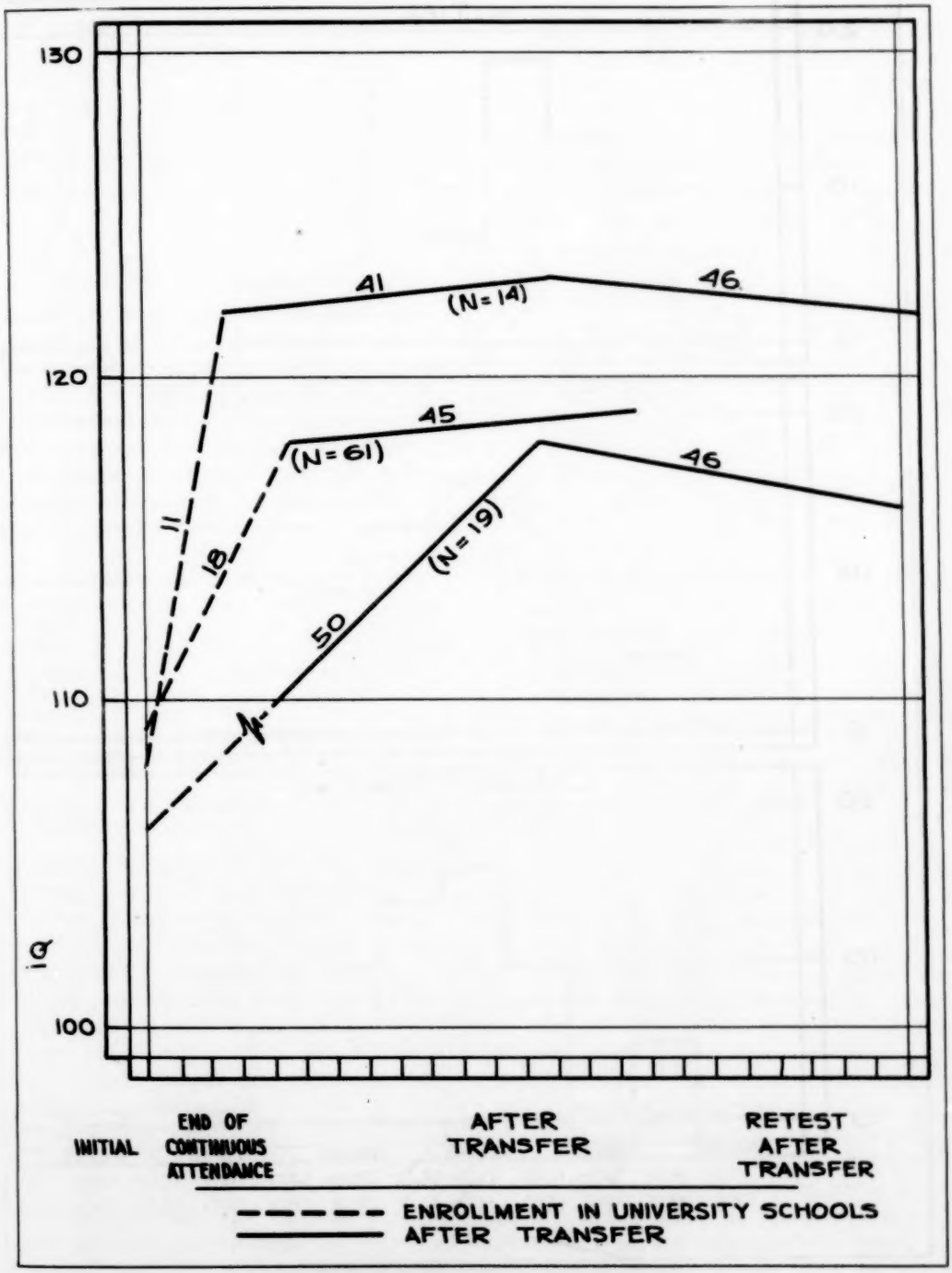
CHANGES IN IQ OF TRANSFER GROUP

	Children			
	77	61	19	14
Initial				
Chronological Age, Months	48.2	47.1	48.6	49.1
Intelligence Quotient	108.4	109.2	106.2	107.9
Standard Deviation	16.7	16.3	16.1	
End of Continuous Enrollment				
Number of Tests		3.6		2.8
Chronological Age, Months		65.0		59.7
Intelligence Quotient		117.8		121.9
Standard Deviation		16.3		
After Transfer				
Number of Tests	4.4	4.8	3.3	3.8
Chronological Age, Months	108.6	109.8	98.6	101.1
Intelligence Quotient	117.7	118.9	118.2	123.2
Standard Deviation	17.7	18.6	16.8	
Retest After Transfer				
Number of Tests			4.4	4.8
Chronological Age, Months			144.1	146.6
Intelligence Quotient			116.4	121.8
Standard Deviation			15.2	

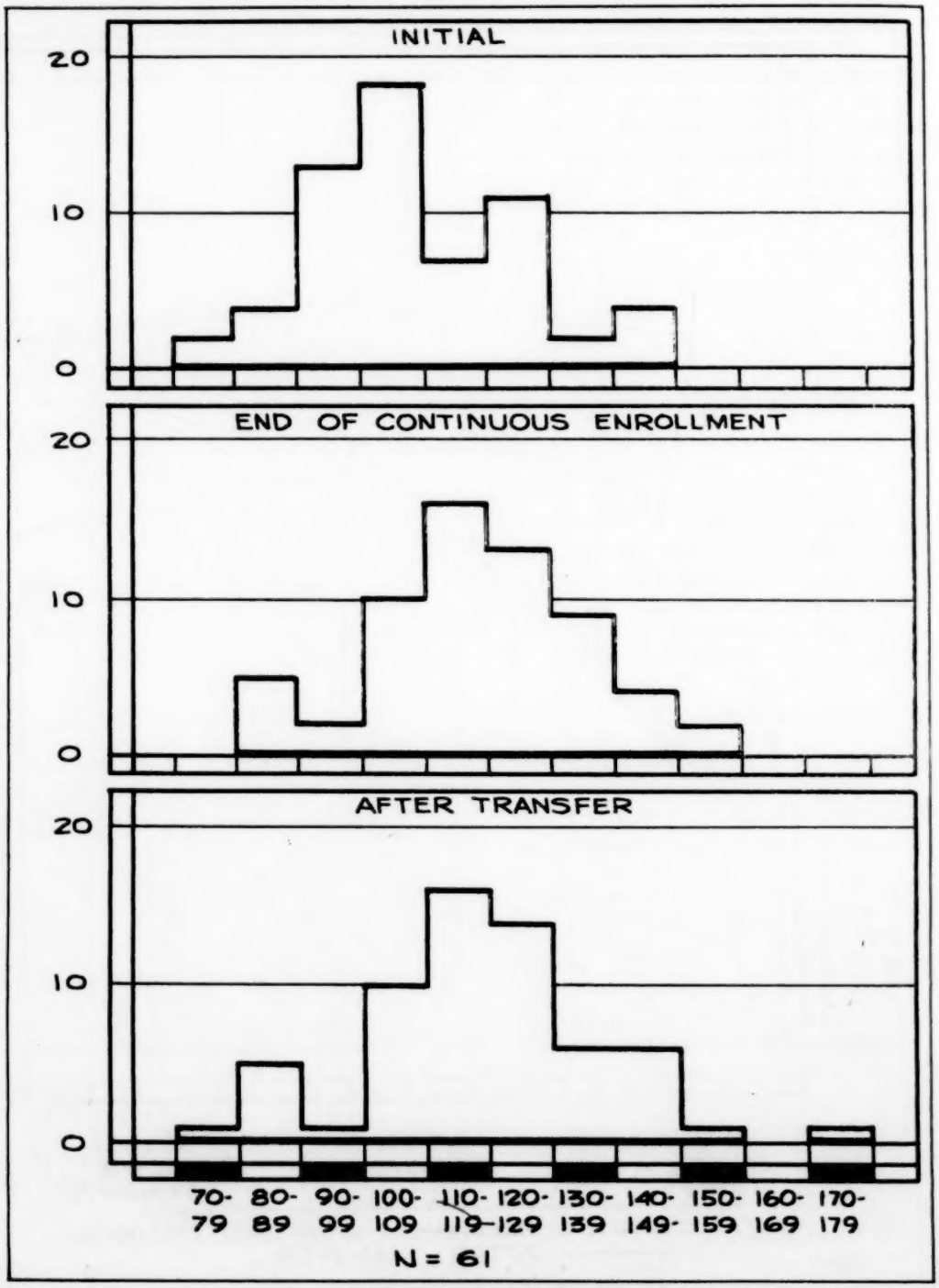
TABLE II

DIFFERENCES AND CRITICAL RATIOS OF DIFFERENCES IN IQ OF TRANSFER GROUP

Children	Chronological Age, Months	Intelligence Quotient	Critical Ratio
Initial - After Transfer			
77	60.4	+ 9.3	3.36
61	62.7	+ 9.7	3.50
19	50.0	+12.0	2.23
Initial - Retest After Transfer			
19	95.5	+10.2	2.00
Initial - End of Continuous Enrollment			
61	17.9	+ 8.6	2.91
End of Continuous Enrollment - After Transfer			
61	44.8	+ 1.1	0.35
After Transfer - Retest After Transfer			
19	45.5	+ 1.8	0.34



CHANGES IN IQ
OF TRANSFER GROUP
(NUMBERS ON LINES REPRESENT INTERVAL IN MONTHS)



DISTRIBUTION OF IQ's OF TRANSFER GROUP

IQ Level	Initial	End of Continuous Enrollment	After Transfer
70- 79	2		1
80- 89	4	5	5
90- 99	13	2	1
100-109	18	10	10
110-119	7	16	16
120-129	11	13	14
130-139	2	9	6
140-149	4	4	6
150-159		2	1
160-169			
170-179			1

Although the mean remains the same on the two latter distributions, the correlation of IQ's is not high. The correlations given below indicate a decrease in consistency with increasing interval between tests, rather than association with similarity in means. Thus the period of major gain (the shortest interval) shows the greatest consistency.

Test	N = 77	N = 61	Interval, Years
Initial versus end of continuous enrollment		.71 ± .05	1.5
End of continuous enrollment versus after transfer		.63 ± .05	4
Initial versus after transfer	.48 ± .06	.50 ± .07	5

Nineteen children were not only examined after transfer, but were reëxamined after a further lapse of nearly four years. The intervals between the two latter examinations (test after transfer and retest after transfer) varied only from forty-four to forty-six months, with a mean of 45.5 months. Over this period there was a loss in IQ of 1.8 points (Table I), with a critical ratio of 0.34 showing 63 chances in 100 of a true difference (Table II). From initial test to the first test after transfer (four years) the intervals varied from twenty to ninety-one months, with a mean of 50.0 months. The gain in IQ was 12.0 points, with a critical ratio of 2.23 or 98.7 chances in 100. From initial test to retest after transfer (eight years) the gain was 10.2 points, with a critical ratio of 2.00 or 98 chances in 100 of a true difference.

Fourteen children had at least two tests prior to transfer and two tests after transfer. Their mean IQ's on the initial test, test at end of unbroken enrollment, and the two tests after transfer are given in Table I and Figure 1. In the eleven months before transfer they gained 14.0 points in IQ, while in the forty-one succeeding months they gained 1.3 points and in the forty-six months following that they lost 1.4 points.

The percentage of children in the different groupings gaining in IQ is shown by the following tabulation:

Test	Per Cent Gaining in IQ (N=61)	(N=19)	(N=14)
Prior to transfer	75		93
Initial to after transfer	69	74	79
Initial to retest after transfer		74	86
End of continuous enrollment to after transfer	52		50
After transfer to retest after transfer		42	50

Although three-fourths or more of the children gained in IQ prior to transfer, only half gained after transfer.

The amount of gain before transfer varied in proportion to the IQ level (Table III and Figure 3). Those lowest on the initial test changed the most whether expressed as gain or as mean change disregarding the sign. Each succeeding classification up to the highest one changed in decreasing amounts. This was not true after transfer, although the lower groupings gained and the higher groupings lost. The amount of change after transfer, disregarding the direction, did not vary in direct proportion to IQ level. The amount of change disregarding sign for the whole group did not differ as between the before and after transfer periods. Thus, the differences before and after transfer were in direction of change rather than in amount of change.

The intervals between initial test and

TABLE III

CHANGES IN MEAN IQ OF TRANSFER GROUP ACCORDING TO IQ LEVEL AND INTERVAL BETWEEN TESTS

Classification	Before Transfer					After Transfer				
	Children	Initial	End of Continuous Enrollment	Change	Change Disregarding Sign	Children	End of Continuous Enrollment	After Transfer	Change	Change Disregarding Sign
According to IQ Level										
70 to 89	6	82.7	97.1	+14.4	15.5	5	85.0	99.8	+14.8	17.6
90 to 109	31	100.2	112.8	+12.6	14.1	12	103.5	105.3	+ 1.8	13.8
110 to 119	7	113.6	123.3	+ 9.7	10.3	16	114.6	119.4	+ 4.8	8.5
120 to 139	13	125.4	129.8	+ 4.4	9.9	22	127.7	122.7	- 5.0	11.3
140 to 159	4	142.8	139.5	- 3.3	6.3	6	146.3	145.3	- 1.0	12.7
70 to 159	61	109.2	117.8	+ 8.6	11.9	61	117.8	118.9	+ 1.1	11.7
According to Interval, Months										
0 to 11	24	101.6	112.2	+10.6	11.9					
12 to 23	21	118.5	127.2	+ 8.7	10.8	5	122.2	117.2	- 5.0	8.6
24 to 35	10	105.4	111.8	+ 6.4	14.8	18	117.5	121.5	+ 4.0	9.7
36 to 47	3	102.0	124.3	+22.3	22.3	14	118.8	118.4	- 0.4	13.6
48 to 59	2	109.0	108.0	- 1.0	1.0	11	117.1	121.2	+ 4.1	12.8
60 to 71	1	92.0	117.0	+25.0	25.0	5	117.2	110.0	- 7.2	14.0
72 to 83						4	115.5	110.8	- 4.7	14.8
84 to 95						4	115.8	122.5	+ 6.7	10.2

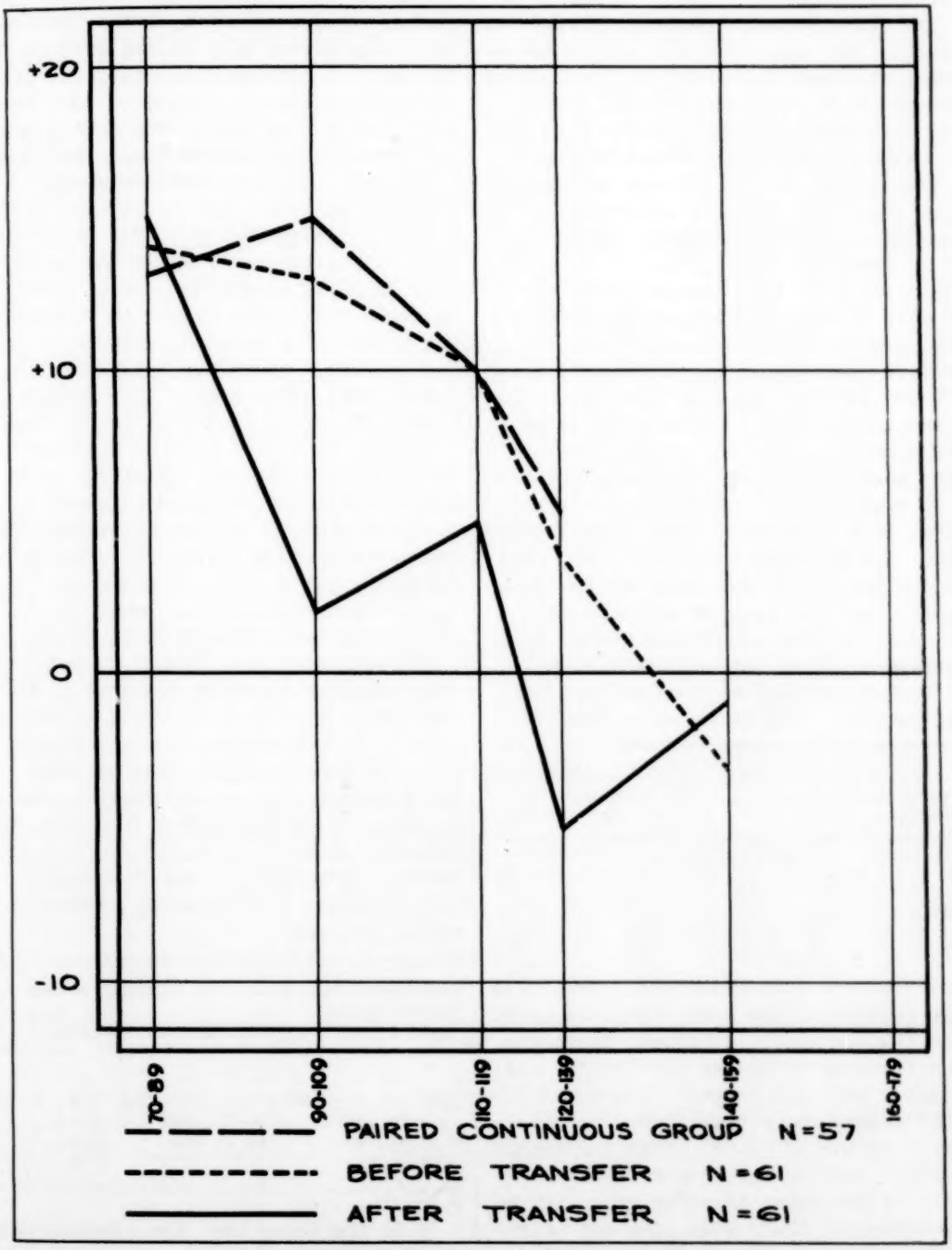
the test at the end of continuous enrollment varied from three to sixty-three months, between the test at the end of continuous enrollment and the test after transfer from twelve to ninety-five months, and between initial test and the test after transfer from twenty to one hundred eleven months. From Table III it will be seen that the amount of change in IQ was not proportionate to the length of interval alone, either before or after transfer.

SUMMARY

So far the findings have indicated that substantial and significant gains in IQ are made by children while attending the preschool laboratories and elementary schools of the State University of Iowa, and that these gains are maintained but not added to over periods of four to eight years following the transfer of these children to other schools.

TRANSFER GROUP COMPARED WITH CONTINUOUS GROUP

In order to compare the transfer children with those who remained in the University schools, an attempt was made to match groups so that the level of IQ and age at the time of entrance to the preschools were comparable and so that the age of the continuous group at the later test was comparable to that of the transfer group at the test after transfer. A further precaution was taken that the number of tests each child had had should be identical with that of his paired companion. Thus, two groups were formed who entered preschool at the same age, were alike in intelligence at the time of entrance, were retested at the same school age, and were given the same number of tests. Both groups attended preschool for a time, the one group continuing in the University schools and the second transferring to other schools. Age, initial level of intelligence, and number



CHANGES IN IQ OF TRANSFER GROUP ACCORDING TO IQ LEVEL

of tests could not be held responsible, therefore, for any differences in gains between the transfer and continuous groups. It is possible that some children in the transfer group may have had additional tests from other sources of which we were not aware, but any advantage from familiarity with the test is thus thrown to the transfer group. Since the testing in the University schools was done under the writer's supervision, it was possible to have an accurate check on number of tests in this group.

Each child in the transfer group was paired with as many continuous group children as were available who met the above criteria for matching. The continuous group cases were averaged, so that the number of pairs was the number of transfer children who could be matched. The limits used in matching were: same year of age on initial test, IQ within 10 points on initial test, same year of age on later test, same number of tests, and unbroken enrollment for the continuous group. It was possible to match thirty-five of the transfer children on these bases. Ninety continuous group children were used, from one to seventeen being used for each pairing, with an average of 2.6 per pairing. The differences between pairs were distributed as follows:

Difference in Chronological Age, Months	Initial	Later	Difference in IQ Points	Initial
0	4	1	0	3
1 to 3	14	13	1,2	7
4 to 6	15	11	3,4	9
7 to 9	2	9	5,6	5
10 to 11	0	1	7,8	10
			9,10	1

The results of the comparison are given in Table IV. On the initial test there was a mean difference in age of 2.1 months and on the later test 1.5 months. There was 0.8 point difference in initial IQ and no difference in number of tests. That the transfer children used in matching were representative of the total transfer group may be seen by comparing their mean IQ's and distribution of IQ's in Tables IV and V and Figure 4 with those of the entire group in Table I and Figure 2. Their age on the later test and their gain from the initial test to the later test are also similar.

From initial test to later test, an interval of 54.8 months, the transfer group gained 8.9 points in IQ, while the continuous group gained 17.0 points over an interval of 51.2 months. The critical ratio for the transfer group is 2.63 or 99.5 chances in 100 of a true gain. The continuous group is, however, 8.9 points higher in IQ on the later test than the transfer group. The critical ratio of this difference is 2.79 or 99.7 chances in 100 of a true difference. Thus, those who remained in the University schools up to an average age of eight and one-half years were higher in IQ than those who transferred to other schools in spite of the fact that those who transferred made substantial gains after their entrance to preschool. This is shown also in Figure 5.

That up to the time of transfer the transfer children did not differ from the continuous group in gains is shown in Table IV and Figure 5. Of the sixty-one children it was possible to match fifty-seven for comparing gains prior to transfer. The criteria for matching were: same year of age on initial test, IQ within 10 points on initial test, same year of age on later test (for transfer children the test at end of continuous enrollment), and same number of tests. An average of 11.0 continuous group children were used for each pairing; in all 627 continuous group children as used. The differences in mean age of the pairs were less than a month on each test, and the difference in initial IQ was 0.8 point. The distribution of differences between pairs was as follows:

Difference in Chronological Age, Months	Initial	Later	Difference in IQ Points	Initial
0	8	11	0	8
1 to 3	38	36	1,2	26
4 to 6	10	8	3,4	15
7 to 9	1	1	5,6	4
10 to 11		1	7,8	4

On the later test the continuous group was 1.9 points higher in IQ than the transfer group, but the critical ratio was only .73 or 76 chances in 100 of a true difference. The gain of 10.9 points in IQ of the transfer group over a period of 17.4 months

TABLE IV

CHANGES IN IQ OF TRANSFER GROUP PAIRED WITH CONTINUOUS GROUP

Group	Children	Earlier Test: Tests	Earlier Test: Chronological Age, Months	Earlier Test: Intelligence Quotient	Earlier Test: Standard Deviation	Later Test: Tests	Later Test: Chronological Age, Months	Later Test: Intelligence Quotient	Later Test: Standard Deviation	Difference: Chronological Age, Months	Difference: Intelligence Quotient	Critical Ratio
Initial to Final												
Transfer*	35	1.0	50.1	109.8	14.2	4.7	104.9	118.7	14.3	54.8	8.9	2.63
Continuous	35**	1.0	52.2	110.6		4.7	103.4	127.6	12.2	51.2	17.0	
Difference		0.0	- 2.1	- .8		0.0	1.5	- 8.9				
Critical Ratio								2.79				
Before Transfer												
Transfer*	57	1.0	46.4	107.9	15.6	3.5	63.8	118.8	15.7	17.4	10.9	3.69
Continuous	57**	1.0	45.8	108.7	13.2	3.5	63.4	120.7	11.6	17.6	12.0	
Difference		0.0	.6	- .8		0.0	.4	- 1.9				
Critical Ratio								.73				
After Transfer												
Transfer*	47	3.6	65.5	121.0	12.5	4.8	111.1	122.2	16.1	45.6	1.2	.41
Continuous	47**	2.2	66.2	120.5	11.1	4.8	110.5	126.1	10.3	44.3	5.6	2.54
Difference		1.4	- .7	.5		0.0	.6	- 3.9		1.3		
Critical Ratio								1.04				
After Transfer												
Transfer*	16	3.4	63.8	119.2		4.8	95.8	120.3		32.0	1.1	
Continuous	16**	3.4	65.8	118.4		4.8	95.7	123.7		29.9	5.3	
Difference		0.0	- 2.0	.8		0.0	.1	- 3.4		2.1		

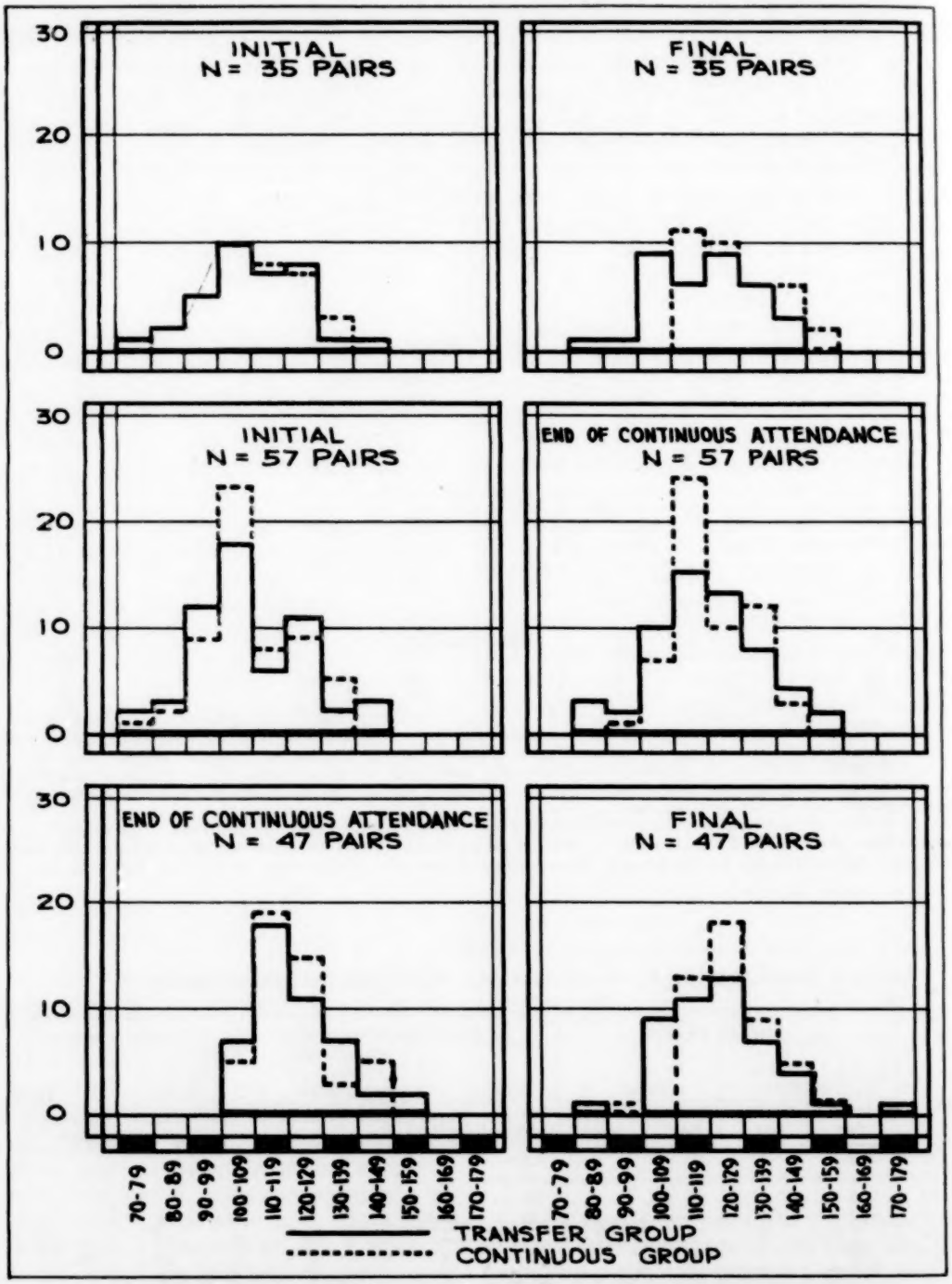
*Each continuous group child used met the following criteria for matching with the transfer child: same year of age on the earlier test, IQ within 10 points on earlier test, same year of age on later test. For each grouping excepting one (N=47) there was the same number of tests at each age. For this group there was the same number of tests at the later age, but not at the earlier age.

**Wherever more than one case was available continuous group cases were averaged for pairings. The number of children used was as follows: N=35, 90 children; N=57, 627 children; N=47, 269 children; N=16, 55 children. The number used for each pair varied from one to thirty-one. The average number per pairing was: 2.6, 11.0, 5.7, and 3.4 respectively.

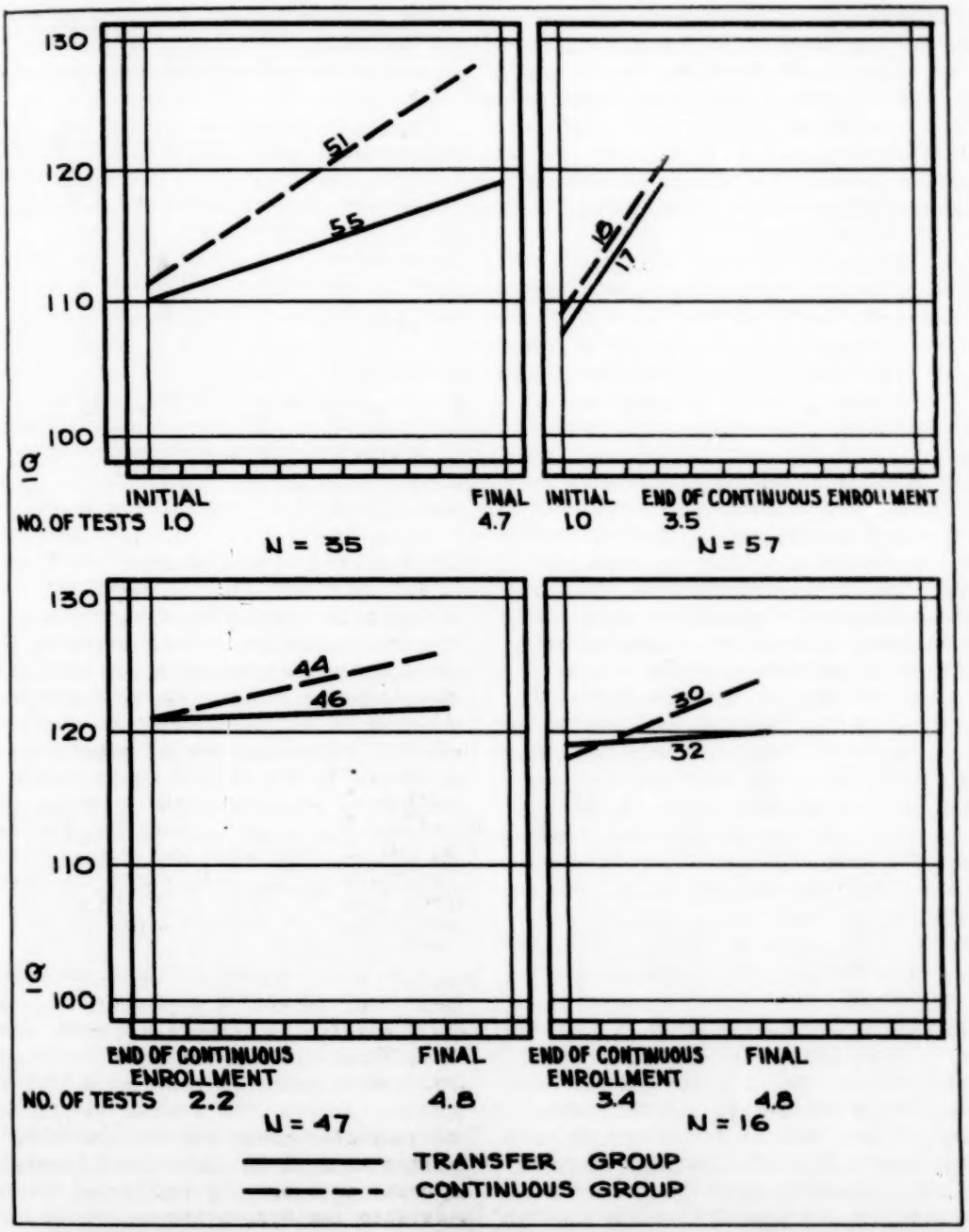
TABLE V

DISTRIBUTION OF IQ'S OF TRANSFER AND PAIRED CONTINUOUS GROUPS

IQ Level	Initial to Final: Initial: Transfer	Initial to Final: Initial: Continuous	Initial to Final: Final: Transfer	Initial to Final: Final: Continuous	Before Transfer: Initial: Transfer	Before Transfer: Initial: Continuous	Before Transfer: End of Continuous Enrollment: Transfer	Before Transfer: End of Continuous Enrollment: Continuous	After Transfer: End of Continuous Enrollment: Transfer	After Transfer: End of Continuous Enrollment: Continuous	After Transfer: Final: Transfer	After Transfer: Final: Continuous
70 to 79	1				2	1						
80 to 89	2	2	1		3	2	3				1	
90 to 99	5	5	1		12	9	2	1				1
100 to 109	10	10	9		18	23	10	7	7	5	9	
110 to 119	7	8	6	11	6	8	15	24	18	19	11	13
120 to 129	8	7	9	10	11	9	13	10	11	15	13	18
130 to 139	1	3	6	6	2	5	8	12	7	3	7	9
140 to 149	1		3	6	3		4	3	2	5	4	5
150 to 159				2			2		2		1	1
160 to 169												
170 to 179											1	



DISTRIBUTION OF IQ's OF TRANSFER GROUP AND PAIRED CONTINUOUS GROUP



CHANGES IN IQ OF TRANSFER GROUP AND PAIRED CONTINUOUS GROUP

TOTAL CHANGES, CHANGES BEFORE & AFTER TRANSFER
(NUMBERS ON LINES REPRESENT INTERVAL IN MONTHS)

was significant, as is shown by the critical ratio of 3.69. Table V and Figure 4 show the distribution of IQ's of the two groups on each of the tests. At the time of transfer the children had had from two to eight tests, with a mean of 3.5 tests. Eighty-one per cent of the transfer children had gained before transfer, as had 98 per cent of the continuous group. The higher percentage for the continuous group is probably due to the method of averaging.

The gains of the continuous group per IQ level (Table VI) correspond very closely with those of the transfer group before transfer (Table III). Each grouping through 120-139 IQ gained but in decreasing amounts with increasing IQ. The changes are again not proportionate to length of interval alone.

It would seem probable from the foregoing that the continuous group not only made a gain comparable to that of the transfer group, but made additional gains after the other group had transferred. To check on this point, a further series of pairings was undertaken in which the changes after transfer were compared with those of continuous group children of the same ages and level of IQ as the transfer children at the time of transfer. The pairs were matched on age and number of tests at final test and age and IQ at an earlier test, the earlier test for the transfer children being that at the end of continuous enrollment. Forty-seven such pairings were possible. Two hundred sixty-nine continuous group children were used, with from one to twenty-four children in each pairing and an average of 5.7 children per pairing.

It will be seen from Table IV that the groups differed 0.7 month in age on the earlier test and 0.6 month on the final test. The transfer group had had 1.4 more tests at the earlier age, but the two groups had had the same number of tests finally. The two groups were 0.5 point apart in IQ on the earlier test at the age of five and one-half years. The transfer group had gained 1.2 points in IQ after transfer up to the age of nine years; the continuous group had gained 5.6 points by the same age and over the same interval (Figure 5). The critical ratios were .41 and 2.54 respectively, indicating

TABLE VI

CHANGES IN MEAN IQ OF PAIRED CONTINUOUS GROUP ACCORDING TO LEVEL OF IQ AND INTERVAL BETWEEN TESTS

Classification	Children	Initial	Later	Change	Change Disregarding Sign
According to IQ Level					
70 to 89	3	84.0	97.3	+13.3	13.3
90 to 109	32	101.4	116.5	+15.1	15.1
110 to 119	8	114.9	124.8	+ 9.9	9.9
120 to 139	14	127.3	132.8	+ 5.5	5.5
70 to 139	57	108.7	120.7	+12.0	11.9
According to Interval, Months					
0 to 11	23	103.3	113.3	+10.0	10.0
12 to 23	20	116.1	125.2	+ 9.2	9.2
24 to 35	8	111.0	122.0	+11.0	11.0
36 to 47	5	102.2	131.0	+28.8	28.8
48 to 59					
60 to 71					
72 to 83	1	100.0	137.0	+37.0	37.0

65 and 99.4 chances in 100 of true gains. The continuous group was 3.9 points higher in IQ than the transfer group on the final test. The critical ratio of the difference was 1.04 or 84 chances in 100 of a true difference. Although the difference is not great and is not entirely significant, it is consistent with the other findings. It may be said that after transfer the children did not gain, whereas those who remained in the University system continued to gain. The distribution of IQ's is given in Table V and Figure 4.

It did not seem probable that the slight difference in number of tests could account for whatever differences appeared, since the transfer group had in all 1.2 tests and the continuous group 2.6 tests in a four-year period. However, as a still further check, the results for sixteen children who could be matched also on number of intervening tests are presented in Table IV. The changes for these children follow closely those for the larger group, the main difference being that the children are a year younger at the final tests and that the interval is consequently shorter.

The question as to why certain children dropped out of the University system and

others remained cannot be answered in entirety. The real reasons seem to be external to those having a bearing on the main problem here. In addition to change of residence, the chief reasons are probably economic ones. The University schools charge tuition. The schools which the transfer children attended do not. The latter are commonly considered to be well-managed, good, and probably superior schools. The distance to school and problems of transportation are probably factors in a considerable number of cases. Whatever the reasons are, the fact remains that as long as the transfer children were enrolled in the University schools they behaved intellectually the same as the rest of the group. It is possible that there were subtle differences in the home atmosphere of the two groups, reflected in parent attitudes, opportunities for enriching experiences, and independent thinking and action. It is not probable, however, that these differences suddenly appeared with change of schools. Whatever differences in home atmosphere there may have been, it is clear that they were not sufficiently potent to divert the course of intellectual development during the period of enrollment in the University schools. There is no real reason, therefore, for believing that differences in home influences can account for the differences in later intellectual development. It would seem that the school can be the dominant force in charting the course of intellectual development, superseding whatever influences the home or other agencies may exert.

SUMMARY

The second section of this study has yielded the following findings: (1) Children who remained in the University system were higher in IQ at the age of eight and one-half years than those who had transferred, although at the age of four they had been alike. (2) They were higher in spite of the fact that the transfer children had gained prior to transfer, behaving intellectually during this period like those who remained. (3) After the one group had transferred, the two groups behaved differently intellectually, the continuous group adding to their gains and the transfer group not gaining.

These results and those of the foregoing section would indicate that gains in intelligence are contingent upon the type of school in which the children are enrolled.

CHANGES IN IQ OF NONPRESCHOOL CHILDREN

Changes in IQ of sixty-eight preschool age children who did not attend preschool were studied. The children were in the infant laboratory group of the Iowa Child Welfare Research Station,[1] and during infancy had been brought by their parents for repeated mental and physical examinations. When they reached the age of two years, they were given the Kuhlmann revision of the Binet test and when three and one-half years of age or older they were given the Stanford revision. They were tested by trained examiners, research assistants in the Station, who had had considerable experience with preschool age children. Up to the time of the Binet tests the children had had several infant examinations, usually one every three or four months, in the same building. They were thus familiar with the general testing procedure and place of examination, but not with the specific Binet tests. They were entered in the group at the request of the parents but were examined by appointment at specific times requested by Station workers. That the group was rather highly selected is shown by the mean IQ of 118.0 (Table VII).

The sixty-eight children were retested at an average interval of 8.2 months. The range of IQ's on the earlier test, omitting one case of 52 IQ, was from 84 to 163. The mean age was 37.1 months, with a range from eighteen to fifty months. On retest the mean IQ was 116.2, a loss of 1.8 points. The critical ratio was .52 or 70 chances in 100 of a true loss. Thirty-five or approximately half of the sixty-eight children gained in IQ on the retest. It was apparent that those highest in IQ were losing and that those lowest in IQ were gaining. Divided into groups according to level of IQ on the earlier test, the changes were as follows:

1. The writer is indebted to Dr. Harold M. Skeels and Miss Eva A. Fillmore of the Station for coöperation in working through this program on the group of children assembled by them for other purposes.

IQ Level	Children	Mean IQ	Change	Change Disregarding Sign
52 - 89	5	80.0	+13.0	13.0
90 - 109	20	100.4	+ 1.7	7.2
110 - 119	8	112.8	+ 9.1	15.4
120 - 139	24	128.7	- 2.9	7.9
140 - 163	11	147.6	-20.0	22.2
52 - 163	68	118.0	- 1.8	11.2

Thirty-three children fell in the ranges of below 120 IQ and thirty-five in the ranges of 120 and above. The mean IQ of the former group was 100.3 and on the retest 105.5, a gain of 5.2 points. Twenty-three of the thirty-three children gained in IQ. The critical ratio of the change was 1.47 or 93 chances in 100 of a true difference. The mean change disregarding sign was 10.0 points. The mean IQ of the higher group was 134.6 and on the retest 126.4, a loss of 8.2 points. Twelve of the thirty-five children gained. The critical ratio of the change was 2.94 or 99.8 chances in 100 of a true loss. The mean change disregarding sign was 12.4 points. Figure 6 illustrates these changes.

In a previous article (7) the writer showed that children attending preschool gained in IQ on repeated tests. The gains followed the course of preschool attendance; they occurred during the academic year while the children were attending preschool, and none occurred during the summer vacation period. Table VIII and Figure 6 show the changes in IQ for nonpreschool children having

TABLE VII

CHANGES IN IQ OF NONPRESCHOOL CHILDREN TWO, THREE, AND FOUR YEARS OF AGE

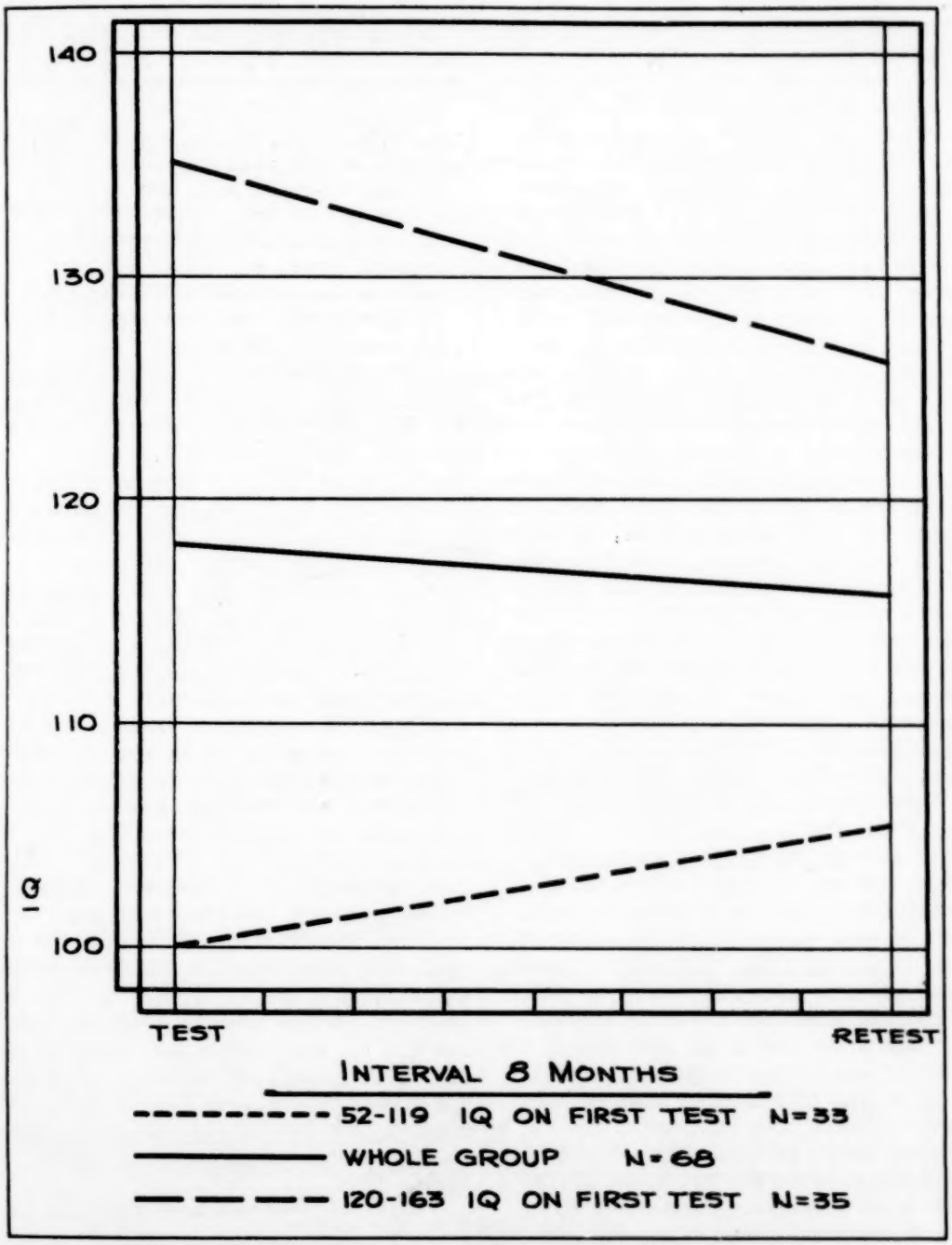
IQ Level	Children	Test			Retest			Change			Critical Ratio
		Chronological Age, Months	Intelligence Quotient	Standard Deviation	Chronological Age, Months	Intelligence Quotient	Standard Deviation	Chronological Age, Months	Intelligence Quotient	Gaining in IQ	
52 to 163*	68	37.1	118.0	20.6	45.3	116.2	17.8	8.2	-1.8	35	.52
52 to 119*	33	36.8	100.3	11.5	45.1	105.5	16.7	8.3	+5.2	23	1.47
120 to 163	35	37.3	134.6	10.5	45.4	126.4	12.5	8.1	-8.2	12	2.94

*With one case omitted, range is from 84.

TABLE VIII

CHANGES IN IQ OF NONPRESCHOOL AND PRESCHOOL CHILDREN HAVING THREE, FOUR, AND FIVE TESTS

Test	Three			Four			Five		
	Children	Chronological Age, Months	Intelligence Quotient	Children	Chronological Age, Months	Intelligence Quotient	Children	Chronological Age, Months	Intelligence Quotient
Nonpreschool									
First	29	33.6	118.4	15	38.4	114.5	8	37.4	111.9
Second	29	42.9	119.3	15	45.1	117.9	8	45.4	116.0
Third	29	50.6	115.6	15	52.5	112.0	8	51.7	110.1
Fourth				15	59.2	114.3	8	59.1	111.1
Fifth							8	64.6	117.8
Preschool									
First	178	46.1	113.6	131	45.6	113.4	90	44.0	114.3
Second	178	53.1	120.6	131	52.6	120.0	90	50.4	121.1
Third	178	60.7	122.6	131	59.9	121.2	90	57.9	121.9
Fourth				131	71.5	124.6	90	67.1	125.6
Fifth							90	83.4	126.2



CHANGES IN IQ OF NONPRESCHOOL CHILDREN TWO, THREE & FOUR YEARS OF AGE

three or more tests compared with the preschool children of the previous article (7), each of whom had attended preschool for two consecutive years or more. Twenty-nine nonpreschool children had had three tests, fifteen four tests, and eight five tests at five to nine months intervals. The contrast in the curves for the two groups is quite marked. Those for the nonpreschool children fluctuate but do not end higher than they began, with the exception of the curve for the eight children which is six points higher on the fifth test than on the first test. The curves for the preschool children are in the upward and never in the downward direction. The 178 preschool children who had three tests gained 9.0 points, the 131 who had four tests gained 11.2 points, and the ninety who had five tests gained 12.0 points, making these gains in fifteen to thirty-nine months. Although the nonpreschool children started slightly higher than the preschool children, they fell below them on the later tests (on the third, fourth, and fifth tests in amounts varying from 7.0 to 14.5 points).

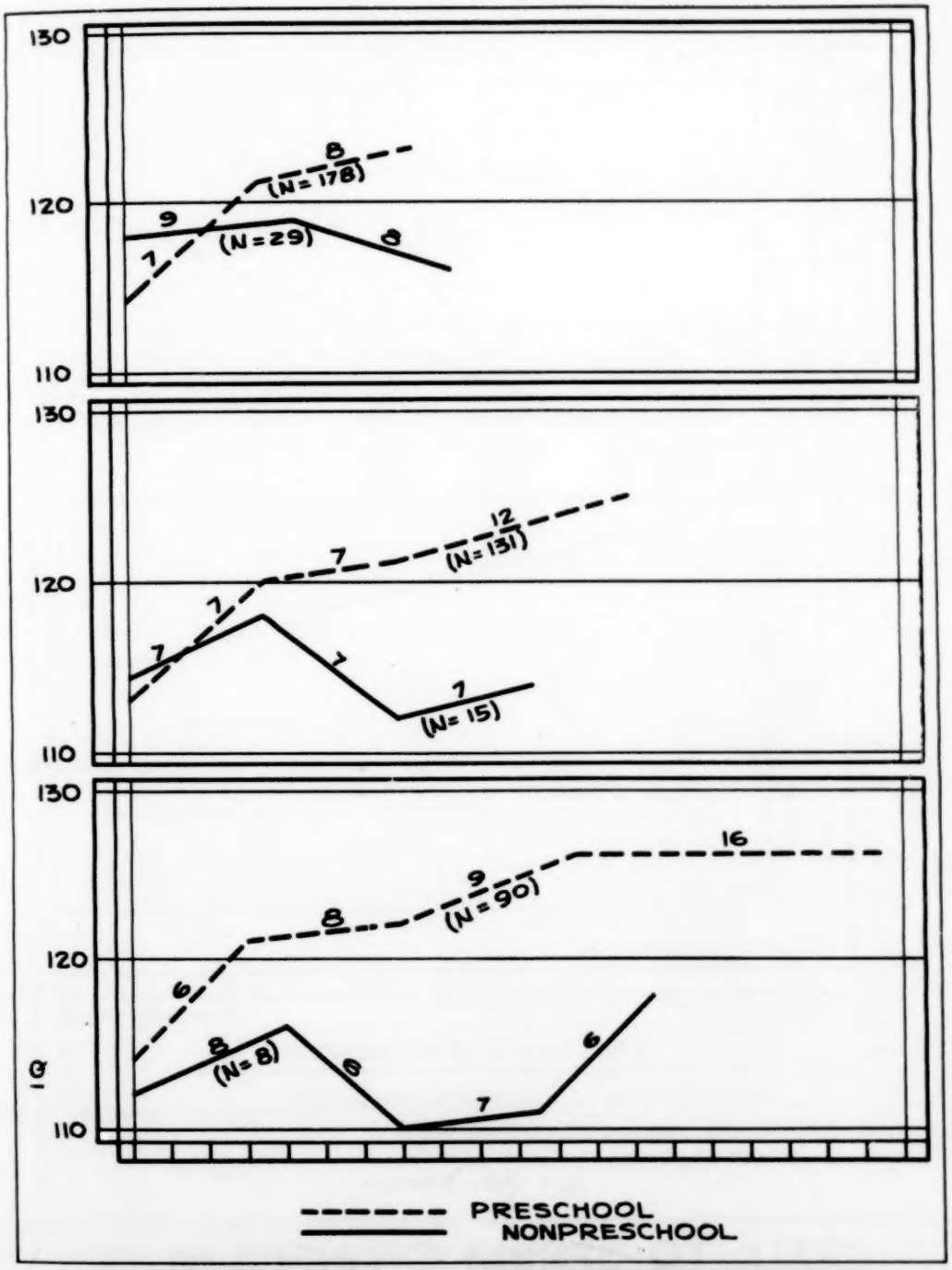
Since the gains of preschool children have been shown to take place during the academic year while the children are in actual attendance, the changes of nonpreschool children over a comparable period were computed and compared with those of preschool children. There were thirty-four nonpreschool cases who had tests in the fall and retests in the spring. Any test given from September through January was considered a fall test, and any test given from March through June was considered a spring test. In order to keep constant the influence of level of IQ and age, the thirty-four nonpreschool children were matched with children attending preschool on the following bases: Each preschool child used was in the same year of age as the nonpreschool child, had an IQ within 10 points of that of the nonpreschool child on a fall test, and had a test the following spring. When more than one child was located who met these criteria, the cases were averaged. From three to twenty-six preschool cases were averaged for each pairing; the mean number of cases per pair was 11.9. A total of 404 preschool cases was used. The following distribution of differences between pairs shows how closely the matching was accomplished. No pair varied more than four months in age, either in the fall or spring, and the majority of pairs did not vary more than four points in IQ on the fall test.

Difference	Chronological Age, Months Fall	Spring	IQ Points Fall
0	5	6	9
1 to 2	25	18	12
3 to 4	4	10	10
5 to 6			2
7			1

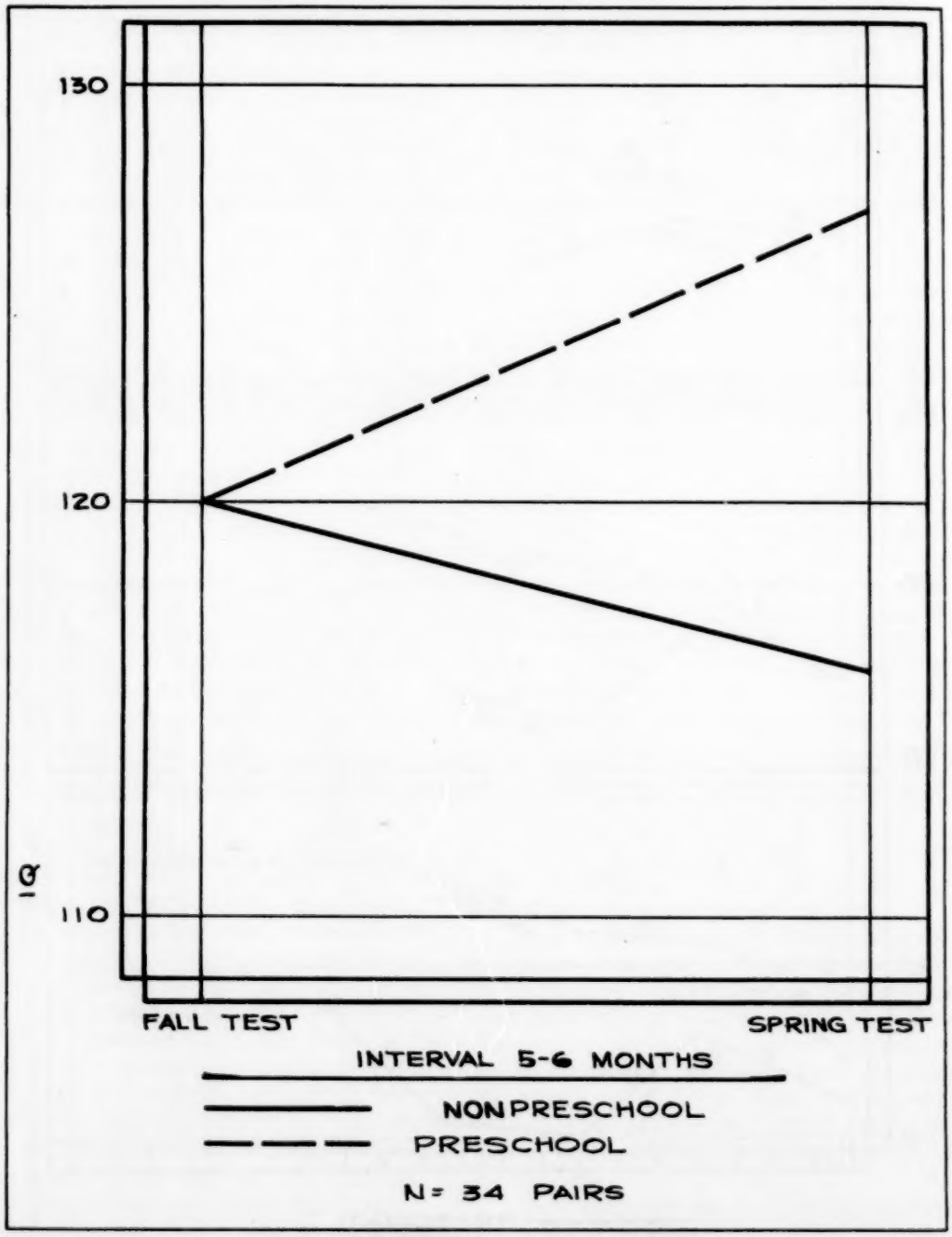
On the fall test the nonpreschool children had a mean IQ of 120.0 and the preschool children 120.1, a difference of 0.1 point (Table IX). In age they differed 0.2 month in the fall and 1.0 month in the spring. The nonpreschool children had a spring IQ of 116.1, a loss of 3.9 points. The critical ratio of the change was 0.97 or 83 chances in 100 of a true loss between the fall and spring tests. The preschool children had a spring IQ of 127.1, a gain of 7.0 points. The critical ratio was 2.07 or 98 chances in 100 of a true gain. On the spring test the preschool children were 11.0 points higher in IQ than the nonpreschool children. The critical ratio was 3.34 or practical certainty of a true difference. Figure 8 illustrates these differences. Preschool and nonpreschool children, then, who are alike in intelligence and age at the beginning of the preschool year grow differently intellectually. Those who attend preschool gain and the others do not.

The distribution of IQ's of the matched groups on both fall and spring tests is given in Table X and Figure 9. On the spring test none of the preschool children was below 110 IQ, while thirteen of the nonpreschool children were below that standing. The preschool children were more closely grouped than previously. This is reflected in the reduced standard deviation on the spring test.

Six children had both fall and spring tests while attending preschool and additional fall and spring tests the following year while not attending preschool. Six others had tests covering a year of nonattendance, followed by a year of attendance. The results,



CHANGES IN IQ OF NONPRESCHOOL AND PRESCHOOL CHILDREN HAVING THREE, FOUR AND FIVE TESTS (NUMBERS ON LINES REPRESENT INTERVAL IN MONTHS)



FALL TO SPRING CHANGES IN IQ OF NONPRESCHOOL AND PAIRED PRESCHOOL CHILDREN

TABLE IX

CHANGES IN IQ FROM FALL TO SPRING OF NONPRESCHOOL CHILDREN TWO, THREE, AND FOUR YEARS OF AGE AND PAIRED CHILDREN ATTENDING PRESCHOOL*

Group	Children	Fall Test			Spring Test			Change		
		Chronological Age, Months	Intelligence Quotient	Standard Deviation	Chronological Age, Months	Intelligence Quotient	Standard Deviation	Chronological Age, Months	Intelligence Quotient	Critical Ratio
Nonpreschool	34	40.6	120.0	17.8	45.7	116.1	15.7	5.1	-3.9	.97
Preschool	34**	40.4	120.1	16.2	46.7	127.1	11.0	6.3	7.0	2.07
Difference		.2	- .1		- 1.0	- 11.0		-1.2		
Critical Ratio						3.34				

*Each preschool child used met the following criteria for matching: same year of age, IQ within 10 points on a test in the fall, and a test the following spring.

**From three to twenty-six preschool cases were averaged for each pairing. The average number of cases per pair was 11.9. A total of 404 preschool children was used.

which can be considered only as suggestive, are presented in Table XI and Figure 10. In each curve there is a tendency towards acceleration in the period of preschool attendance, and flattening during the period of nonattendance. Both groups were initially high in IQ.

TABLE X

DISTRIBUTION OF IQ'S OF NONPRESCHOOL AND MATCHED PRESCHOOL CHILDREN

IQ Level	Fall Test		Spring Test	
	Nonpreschool	Preschool	Nonpreschool	Preschool
80 to 89			2	
90 to 99	5	4	2	
100 to 109	7	8	9	
110 to 119	4	6	6	11
120 to 129	5	4	8	7
130 to 139	8	7	6	11
140 to 149	3	4		5
150 to 159	2	1	1	

SUMMARY

Nonpreschool children (children two, three, and four years of age who did not attend preschool) did not change appreciably in IQ over an eight month period. Those who were around average or slightly above on the first test showed some tendency to increase in IQ, while those who were very superior tended to decrease.

Although preschool children (children attending preschools) having three, four, and five tests increased markedly in IQ, nonpreschool children did not.

Starting out with the same IQ at the same age in the fall, preschool children gained in IQ and nonpreschool children did not, so that the two groups were significantly apart the following spring.

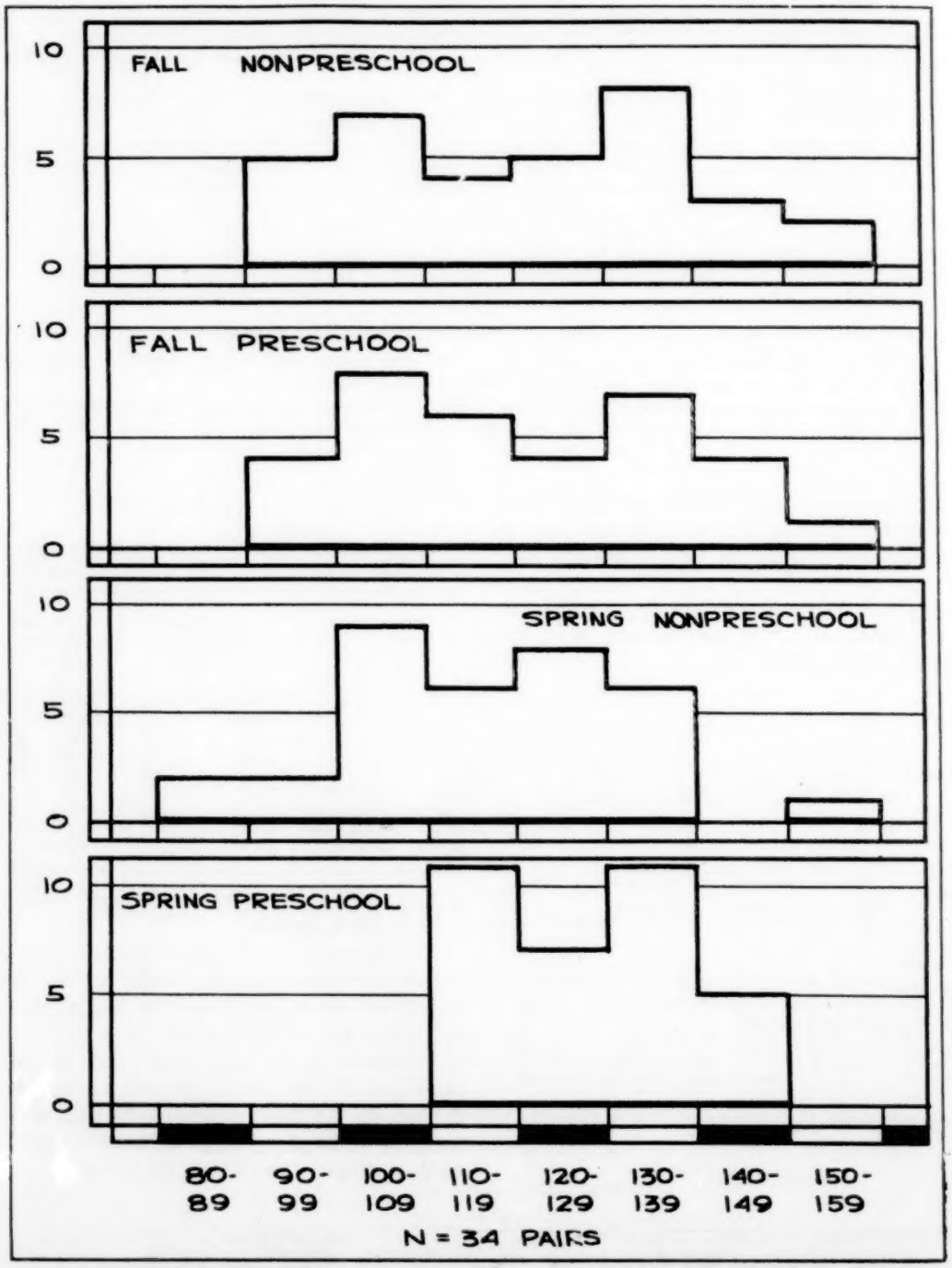
TABLE XI

CHANGES IN IQ FROM FALL TO SPRING WHILE ATTENDING PRESCHOOL AND WHILE NOT ATTENDING

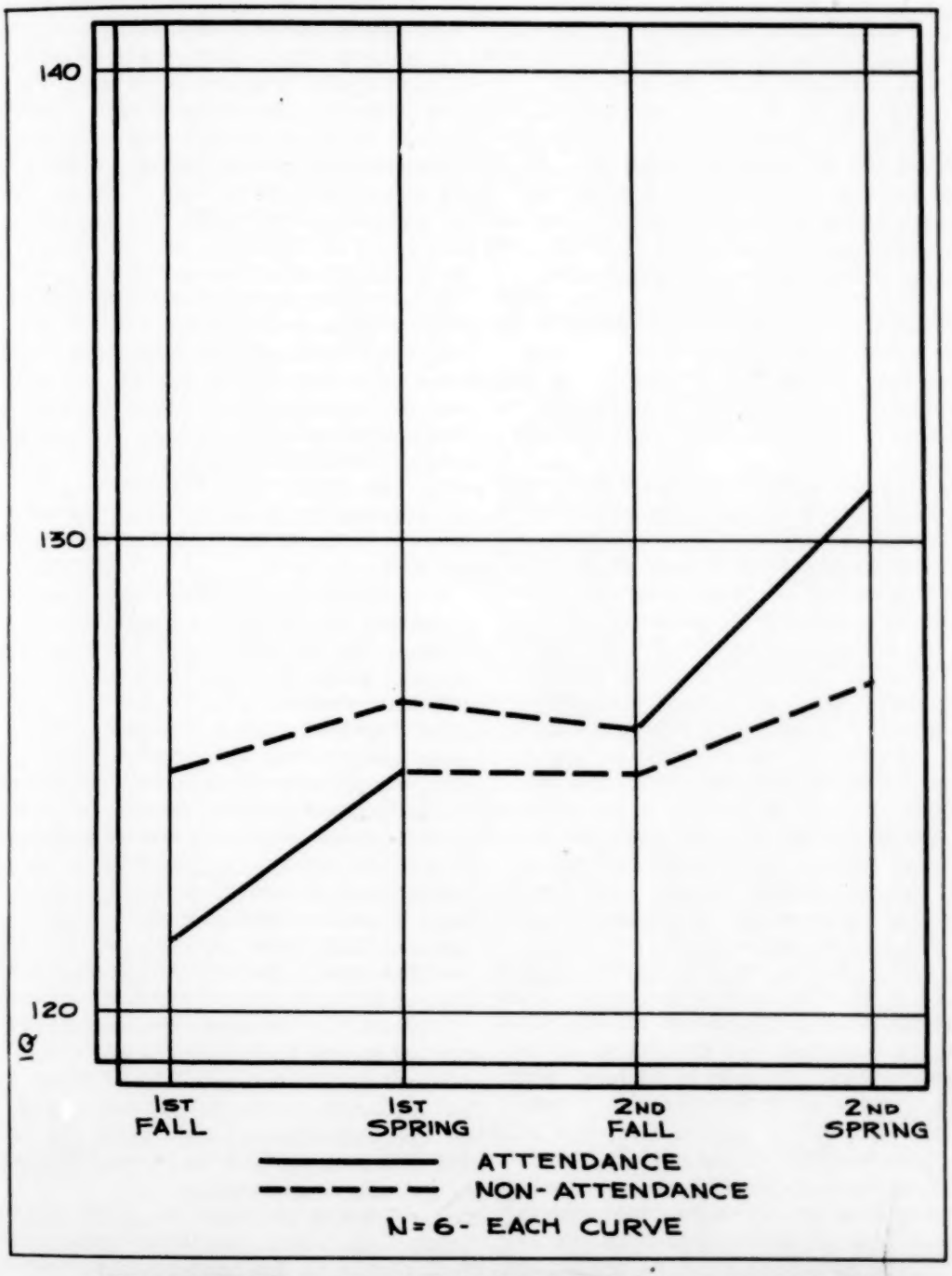
Test	Attendance Followed by Nonattendance (N = 6)		Nonattendance Followed by Attendance (N = 6)	
	Chronological Age, Months	Intelligence Quotient	Chronological Age, Months	Intelligence Quotient
Fall, First Year	36.0	121.5	47.5	125.3
Spring, First Year	42.8	124.8	53.0	126.5
Fall, Second Year	50.7	125.3	60.7	126.2
Spring, Second Year	56.2	127.0	66.5	131.2

INTERPRETATION OF FINDINGS

That intellectual development of elementary and high school pupils may vary with type of school experiences seems to be established by the foregoing findings.



DISTRIBUTION OF IQ's OF NONPRESCHOOL AND PAIRED PRESCHOOL CHILDREN



CHANGES IN IQ FROM FALL TO SPRING
WHILE ATTENDING PRESCHOOL AND WHILE NOT ATTENDING

Children in one school system developed differently intellectually from children in other schools. The consistency of results is striking. This finding, coupled with the additional information at the preschool ages, places us one step further toward explanation of the marked gains in IQ reported previously for children attending the University schools. It has been demonstrated that these gains are associated with particular situations, that is, enrollment in the University school system including preschool, elementary school, and junior high school, each under different supervision but forming a continuous series. In spite of the fact that by the age of entrance to elementary school the children had attained a very superior standing, they continued to gain.

That these changes represent real and not spurious gains in intelligence is indicated by various aspects of the evidence. Personal acquaintance with many of the children and knowledge of their interests, activities, achievements in academic competition, and other achievements have strengthened the writer's belief that they are functioning mentally in accordance with their new IQ levels. A permanent change in intellectual standing can be effected in one to one and one-half years that will last at least four to eight years, up to an average age of twelve years, provided that the children are in schools such as the "other schools" of this study. It may seem surprising that as great and as permanent a change can be accomplished in so short a period, but nevertheless the results confirm this. As to what would have happened if the transfer children had attended schools inferior to the ones they did attend, we do not have information. Neither do we know what the upper limits of stimulation are; some other school situation may be even more stimulating than the University schools.

The evidence shows that the explanation of changes in IQ is not to be found in the test itself nor in the selection of children. To the extent to which we are willing to accept the findings of intelligence tests as indicators of intelligence, they should be accepted here. Ordinary practice effects are ruled out because of the long interval between some of the tests and because of the fact that the groups compared had the same amount of past experience with the test at the same ages. That there could have been specific coaching seems unlikely since the investigation extended over several years, during which time the children were under many different teachers some of whom, at least, were unfamiliar with the details of the test. Selection of children is also ruled out in that the compared groups were alike in age and initial intelligence. Furthermore, the transfer children behaved intellectually during their stay in the University system exactly like those who continued in the University schools. There is no reason to believe that their further progress would have varied from that of the continuous group. Whatever selective factors there may have been other than those taken into account, they were not sufficiently effective to prevent gain while in the University schools.

The bearing of these results on the constancy of the IQ and prediction becomes clear. The failure of the transfer children to gain after transfer confirms the commonly accepted view that the IQ tends to remain about the same over a period of years. It should be pointed out, however, that while this may be true of groups it is not true of individuals within the groups. Although the mean remained constant, the mean amount of change was around 11 points, both for elementary and preschool age children. Regardless of whether groups kept the same mean or changed significantly, the amount of change was the same. The real difference was lodged in direction rather than sheer amount of change. Apparently, the degree of constancy of the IQ for groups and the direction of change for individuals depend upon how stimulating the school environment proves to be. The schools attended by the transfer children are probably quite representative of schools in general.

It would be better to think of intelligence test results as representing intellectual status at the moment and to proceed cautiously on the problem of precise prediction until more is known about variations under differing conditions. Certainly intelligence cannot be regarded as static; it

should be regarded in terms of growth rather than as a fixed quantity. Nevertheless, there are probably definite constitutional limits within which growth may be altered. To what age alteration may continue cannot be answered from present data. Since, on account of the low ceiling of the Stanford-Binet test, no child was tested who was over fourteen years, five months of age, we do not know how much beyond this age gains might continue.[1]

In just what respects the schools of the present study really differed is not easy to answer. There is available in published form a rather complete description of practices and procedures in the Iowa Child Welfare Research Station preschools in "A Manual of Nursery School Practice." (4) While this tells what is done, it does not give a clue as to which of the practices may be effective in stimulating mental development nor does it tell how they differ from home practices. It is easy to think of some outstanding characteristics of preschools that are not duplicated in homes, for example, variety of play materials and equipment and daily association with many children of the same age. But differences of this gross sort can no longer be made to carry the load at the elementary school ages. Here the comparison is not school versus home but school versus school. Supplementing quality and methods of teaching, the factors of homogeneity of grouping and relative placement in a group probably deserve investigation as an explanatory hypothesis. A large proportion of the total enrollment in the University elementary schools has come up through the preschools. In the first grade, for example, the proportion of children formerly attending preschool may be as high as three-quarters. The mean IQ of a classroom hovers around 120. A child of 120 IQ in the first grade here has more competition from his intellectual peers than a comparable child in the other schools. Furthermore, the levels of teaching may be adapted to these differing levels and ranges of ability. Sheer association with others of comparable and higher ability without appropriate materials and appropriate guidance probably is not sufficient to effect gains.

It is interesting to note that while all groups, including continuous, transfer children before and after transfer, preschool, and nonpreschool children, show an inverse relationship between level of IQ and gain, a different sequence is presented by Cattell's (2) group from the Harvard University growth study. Her results for children retested at zero to twenty-four months' and thirty-six to seventy-two months' intervals are given here by way of comparison:

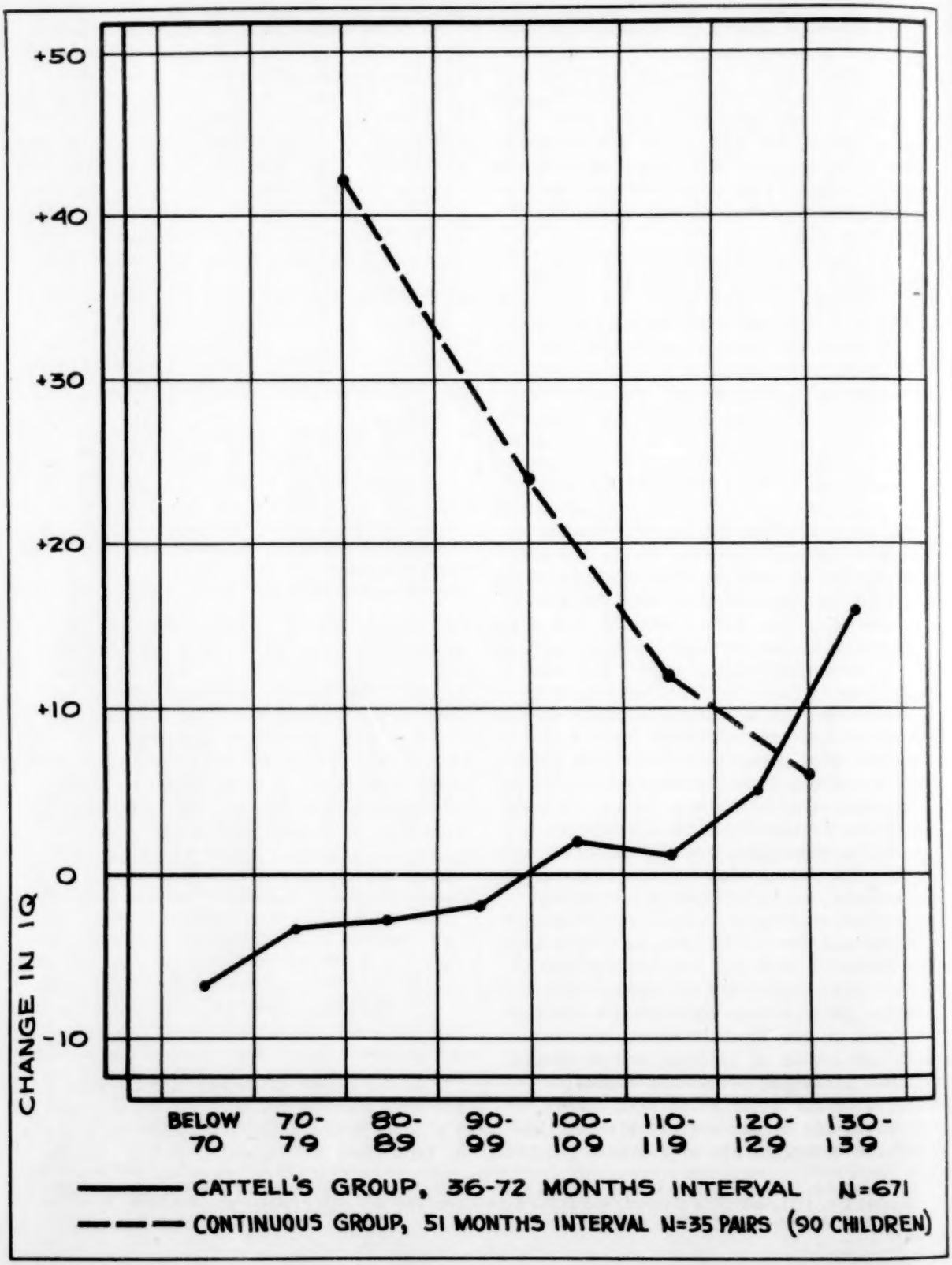
IQ Level	0 to 24 Months: Children	0 to 24 Months: Median Change in IQ	36 to 72 Months: Children	36 to 72 Months: Median Change in IQ
Below 70			15	- 7.0
70- 79	41	- 0.8	38	- 3.5
80- 89	75	+ 0.8	110	- 3.3
90- 99	116	- 0.6	193	- 2.2
100-109	127	+ 1.1	166	+ 1.7
110-119	138	+ 1.1	101	+ 1.4
120-129	66	+ 0.8	35	+ 4.8
130-139	26	+15.0	13	+16.0
140 and above	18	+ 8.5		

Her changes are in complete reversal of those in this investigation. Her inferior children lost and her very superior children gained. The wide discrepancy between her results and those given here is shown by the following tabulation and Figure 11. The changes for the thirty-five continuous group pairs from Table IV were chosen as representing the group closest to Cattell's in interval, the mean interval being 51.2 months. The actual number of children involved was ninety.

IQ Level	Pairs	Children	Mean Change
70 to 89	2	2	+42.0
90 to 109	15	28	+23.6
110 to 119	8	37	+12.2
120 to 139	10	23	+ 5.6

Cattell does not state specifically from what sources her children were drawn. In a later article (3) she sought to explain the fact that her highest children gained

1. For a more complete presentation of this point of view on the nature of intelligence, the reader is referred to Chapters VII, VIII, and IX in Stoddard, George D., and Wellman, Beth L.: Child Psychology. New York: Macmillan, 1934, pp. xii, 419, (pp. 129-182).



CHANGES IN IQ ACCORDING TO IQ LEVEL OF CATTELL'S GROUP AND THE CONTINUOUS GROUP

while Terman's (1) "geniuses" lost. She attributed the differences to two main factors which seemed to be the most probable causes: (1) the method of selecting cases and (2) the difference in ages. One main difference in selection was that Cattell used the mean of two tests for determining IQ classification. The results presented in this article and in the author's earlier studies (6,7) and those of Lincoln (5) confirm Terman's finding of a drop in IQ for children with initial IQ's of 140 or above. But such factors as selection of cases and age do not seem adequate to explain the regularity of progression of changes with IQ level or the fact that the changes are in reverse order in Cattell's study and this one. Differential environmental stimulation would seem to offer a plausible explanation.[1]

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1. Possibly we can look to Cattell's sources to find a situation that is really stimulating to the highest levels.

INFANT IQ RATINGS EVALUATED AFTER AN INTERVAL OF SEVEN YEARS

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This report is based upon Kuhlmann-Binet tests given to infants at the age of twelve months and a follow-up Stanford-Binet seven years later. The thirty-seven children studied represent a widely scattered group from the standpoint of environmental and educational background. Very few have had nursery school experience; some are now living in suburban communities but most are in public, private, and parochial schools of New York City.

Although the cases are few and the results of analysis inconclusive, the long interval between tests and the heterogeneous nature of the group combine to make the study worth while.

RELATED WORK OF OTHER INVESTIGATORS

Critical studies of the reliability of mental tests of preschool children have been limited, as a rule, to children beyond the age of eighteen months. Goodenough (3), in a study of nearly 400 children, included cases ranging in age from nineteen to fifty-four months. Johnson (2) limited her study to children two years of age and older. Driscoll (1) used as a basis of comparison with later tests Kuhlmann-Binet ratings obtained between the ages of two and four years, although infant ratings were compared over short intervals. The three studies cited agree upon two important points: (1) There is a tendency for tests of very young children to be unreliable. (2) There is a general tendency to gain rather than to lose on retests.

Studies of school children previously tested before the age of school entrance often show a loss in IQ ratings when school ratings are compared with those obtained during the preschool period. This is suggested in a sampling analysis made by Dr. Gertrude Hildreth and contributed to this study. Of the twenty cases included in the sampling, thirteen lost from 2 to 37 points in IQ when school tests were compared with tests obtained before the age of four years. The remaining seven cases gained from 1 to 22 points at the time of the school test, but the median change in IQ rating was minus 17.5 points.

AGE OF TESTING

The children in the retest group ranged in age from seven years, zero months to eight years, seven months with a median age of approximately eight years, zero months. With one exception, all had been previously examined for the first time at the age of twelve or eighteen months. Thirty-one had first been tested at the age of twelve months, five at the age of eighteen months, and one at the age of twenty-four months. All infant tests were given within two weeks of the half-yearly birthday.

RESULTS

The initial group of 100 babies, of whom only thirty-seven could be located for retests, obtained on infant tests a median IQ rating of 117. The thirty-seven cases obtained on the initial infant test a median IQ rating of 128, with a range in IQ from 100 to 165. It is evident that this small group represents a selective sampling of superior children as judged by early Kuhlmann-Binet tests.

When retested on the Stanford revision of the Binet at the age of eight years, the thirty-seven cases obtained a median IQ rating of 119 with a range from 88 to 148, maintaining in lesser degree the superiority indicated by infant tests.

In view of the fact that the group represents a selective sampling and that the Kuhlmann-Binet was imperfectly standardized at the time of the tests, it is significant that the infant tests predicted as well as they did. The passing or failing of a single test item could change the IQ rating of a twelve-month-old infant as much as 20 points. The following tabulation shows the correlation coefficients obtained by comparing IQ ratings at different age levels:

Ages Compared	Children*	r	PE_r
12 months with 18 months	42	.719 ±	.05
12 months with 24 months	38	.504 ±	.08
12 months with 8 years	27	.552 ±	.09
18 months with 24 months	35	.741 ±	.05
18 months with 8 years	21	.418 ±	.12
24 months with 8 years	20	.241 ±	.14

*Two colored babies and two sick babies were omitted in this computation.

It may be observed that the test given to this sampling of infants at the age of twelve months predicted rating at the age of two years no better than at the age of eight years. Also the Kuhlmann-Binet rating obtained at the age of twelve months correlates in this instance more highly with rating at eight years than with ratings obtained at eighteen or twenty-four months. The advisability of attempting further analysis of many more ratings is suggested.

A rough summary of the amount and nature of change in IQ rating at intervals varying from six months to eight years is interesting in the light of studies which have suggested a general tendency upon the part of older preschool children to gain in IQ when tests are repeated at relatively short intervals. The following tabulation shows the change in IQ points when infant tests are compared (colored and sick babies are included in the comparison).

Change in IQ Points	Age, Months: From 12 to 18	From 18 to 24	From 12 to 24
		Gain	
20 to 24	1	2	2
15 to 19	0	1	1
10 to 14	3	0	1
5 to 9	2	1	3
1 to 4	2	2	2
Children Gaining	8	6	9
Mean Gain	9.6	12.17	11.0
		No Change	
	0	1	0
Children Not Changing	0	1	0
		Loss	
1 to 4	1	4	1
5 to 9	4	2	4
10 to 14	1	0	2
15 to 19	0	2	2
20 to 24	2	0	0
25 to 29	2	0	0
Children Losing	10	8	9
Mean Loss	14.0	7.2	9.83
Mean Change	12.0	8.7	10.42
Mean Net Change	- 3.5	+ 1.0	+ .58

The cases are too few to warrant fine statistical analysis, but the tabulation shows no tendency for the IQ to increase between twelve and eighteen months. The data at hand are too limited to permit a computation of the reliability of the possible tendency to gain when tests given at twelve or eighteen months are compared with tests at the age of twenty-four months, or of the possible tendency to lose when tests at twelve months are compared with retests at eighteen months.

When tests given at the ages of twelve, eighteen, and twenty-four months are compared with tests given at the age of eight years, the incidence of loss in IQ points upon retests at the age of eight is greater than the incidence of gain. The tabulation given on the following page shows the nature and amount of change in IQ ratings of the thirty-seven children who were tested in infancy and retested at the age of eight years.

Change in IQ Points	From 12 Months to 8 Years	From 18 Months to 8 Years	From 24 Months to 8 Years
		Gain	
30 to 34	0	0	1
25 to 29	0	0	1
20 to 24	2	2	1
15 to 19	0	2	4
10 to 14	2	1	0
5 to 9	4	2	2
1 to 4	3	3	0
Children Gaining	11	10	9
Mean Gain	9.41	11.15	18.11
		No Change	
	0	0	1
Children Not Changing	0	0	1
		Loss	
1 to 4	5	4	4
5 to 9	4	0	2
10 to 14	3	2	2
15 to 19	1	2	3
20 to 24	3	1	0
25 to 29	2	2	1
30 to 34	0	0	0
35 to 39	1	1	1
40 to 44	0		
45 to 49	0		
50 to 54	1		
Children Losing	20	12	13
Mean Loss	15.12	15.08	12.54
Mean Change	13.10	13.30	14.17
Mean Net Change	- 6.42	- 3.29	0.00*

*Nine cases gained 163 points, thirteen cases lost 163 points.

In order that the predictive value of the tests given at the age of twelve months might be analyzed further, a comparison was made between the grouped IQ ratings obtained in infancy and ratings obtained at the age of eight years. In the next column is given a rough estimate of the usefulness of the infant tests given to the thirty-one children who were tested at the two specified ages. There were six infants who rated 140 or above at the age of twelve months. When retested at the age of eight years, the average IQ rating obtained by these six children was 126. Their IQ ratings ranged from 107 to 148 at the age of eight.

IQ at 12 Months	Cases	Mean IQ at 8 Years	Range in IQ at 8 Years
140 and Above	6	126	107 to 148
130 to 139	6	126	106 to 143
120 to 129	4	118	100 to 127
110 to 119	10	113.8	97 to 136
100 to 109	5	101.4	98 to 109

According to this analysis there is nothing to indicate any difference in the predictive usefulness of an infant IQ rating of 130 to 139 as compared with a rating above 140, that is, as far as the thirty-one cases are concerned. Very few conclusions may be drawn from the tabulation. No child who rated as high as 130 IQ at the age of twelve months received an IQ of less than 106 at the age of eight years. Children who rated between 100 and 109 IQ did not vary greatly when retested at eight years of age.

SUMMARY

The few cases included in this study do not justify final statements as to the reliability of infant ratings as judged by tests given after an interval of seven years, but certain questions have been definitely raised. Granting that the sampling is sufficient to suggest further studies, it would appear desirable to study the long-time predictability of infant tests as compared with tests given during the nursery school period. At a given age of twelve or eighteen months it would also seem desirable to study the relative reliability of IQ ratings which are approximating normal as compared with very high or very low ratings.

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MEASUREMENT OF ATTITUDES TOWARD NURSERY SCHOOLS

by
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Recent issues of this journal, as well as of many others in the fields of education and sociology, have devoted a comparatively large amount of space to the consideration of the social phenomena called attitudes. Various writers have chosen different aspects of the problem, ranging from consideration of the possibility of measurement through various theories regarding their nature to the problem of techniques or measuring devices themselves.

When educational theorists and workers in the field came to the significant conclusion that all pedagogy should be child centered and not imposed upon children from adult standpoints, the way was left open for just such a deluge of measuring devices as has resulted. It became at once necessary to know the nature of these children whom we are to educate. This is true not only in the educational field but also in sociology, in psychology, and even in phases of medicine. In social case work, psychiatry, treatment of criminals, and even in college entrance examinations, attempts have been made to individualize methods on the basis of the total situation, with the resultant conclusion that personality and attitudes must not be overlooked in any complete scientific diagnosis.

METHODS OF MEASURING ATTITUDES

Many have argued that attitudes are too subjective to be accurately measured. It is not the purpose of this discussion to prove or disprove the possibility of measurement, but simply to cite methods reviewed in an attempt to select a technique for a recent study on The Measurement of Attitude Toward Nursery Schools, which is to be described herein. For more complete data on the studies reviewed and the detailed results of the investigation, the reader is referred to the original manuscript (2).

Six means of measuring attitudes were found to be employed oftenest:

1. Ranking method
2. Questionnaire method
3. Paired comparison technique
4. Ratings (self-ratings included)
5. Records of overt behavior
6. Method of equal appearing intervals

The latter method was chosen for the purpose of this study. The best known exponent of the method of equal appearing intervals is Thurstone, whose work (3) served as a model for the present study. Thurstone applied the method in his measurement of many social attitudes, including those toward the church, war, birth control, prohibition, criminals, communism, patriotism, capital punishment, unions, divorce, evolution, immigration, preparedness, freedom of speech, League of Nations, censorship, Monroe Doctrine, and many others.

In defense of Thurstone's method it is necessary to cite the psychophysical law known as the Weber-Fechner Law. This law points out a specific logarithmic interrelationship between the strength of stimulus and the least detectable change in sensation, so that it can be determined statistically just how much the stimulus must be increased to see any change in sensation. Cattell (1) first applied this law to the measurement of other than purely sensory stimuli by using it to get a measure of the comparative degree of eminence of American men of science.

He found that persons are somewhat in agreement as to the comparative eminence of great men. Thus attitudes, purely psychological factors, came to be measured by the same psychophysical method.

THE PROBLEM

It has been the problem to construct a base line--a horizontal line representing the whole range of attitudes from those expressing the strongest appreciation of nursery schools to those most strongly opposed to them. Between these two extremes will be found somewhere a neutral position where attitudes there expressed will represent indifference toward nursery schools. In this way ordinate numbers along the intervening scale points will theoretically be measures of the popularity of each attitude. The problem then becomes one of the "more or less" type of judgment, one judgment being more or less in favor of nursery schools than the others.

Definition of Attitude

The first difficulty was encountered in the attempt to define attitude. There were as many definitions as authors. In fact, many of the fundamental differences apparent among methods of measurement seemed to be due to disagreement as to the nature of attitude. For the purpose of this study the definition by Thurstone and Chave (3, pp.6-7) will suffice. "The concept 'attitude' will be used..... to denote the sum-total of a man's inclinations and feelings, prejudice or bias, preconceived notions, ideas, fears, threats, and convictions about any specific topic." Thus attitudes are here measured only insofar as they are represented by verbal expression. Sincerity, truthfulness, and conduct as related to expressed attitudes are not determined.

Collection of Statements

The first step in the construction of the scale consisted of collecting 175 statements of opinion concerning nursery schools. Eleven of these were discarded at once because of duplication of content, leaving a total of 164. Three sources yielded the stated opinions:

1. Literature: Twenty periodicals, some of them academic and technical in nature and some of them popular, were scanned for stated opinions concerning nursery schools.
2. Written statements were gathered from parents, students, teachers, and research workers associated with the University of Michigan.
3. Random remarks were collected by the writer through conversational channels.

Selection of a Scale

An attitude scale of eleven intervals (0 to 10 inclusive) was chosen, the same as that used in the Thurstone and Chave study (3). The end of the scale marked zero was designated as negative or most opposed to nursery schools, while the end of the scale marked 10 was considered positive or most favorable to nursery schools. In the same manner position 5 expressed a neutral attitude. All intermediate intervals represented the whole range of attitudes separating the two extremes. The model scale emerged as below:

Extremely Opposed				Neutral					Extremely Favorable	
0	1	2	3	4	5	6	7	8	9	10

Allotment of Statements to Scale Positions

At this point a deviation from the Thurstone technique occurs. Thurstone followed the sorting procedure in which many subjects were asked to sort the collected statements into eleven piles which represented an evenly gradated series of attitudes and which corresponded to the steps in the selected scale itself.

In assigning scale positions for the statements in the present study, mimeographed sheets were made up; the first page comprised an instruction sheet on which the subject was asked to assign scale values by encircling the number along the scale opposite each statement which best represented the degree of appreciation or depreciation expressed by that statement. Personal opinion was not to be considered, the procedure being merely a ranking of statements based on content. A sample copy is included in the scale above.

The statements were rated according to the sample on page 90 by 100 persons,

including the staff of the University Elementary School at Ann Arbor, Michigan and members of four classes in the School of Education at the University of Michigan.

Tabulation of Returns from Judges

Allocation of the statements to scale positions was made possible by summarizing the ranking of the statements by the 100 judges. Statistical allotments by the judges were tabulated so that the frequency of placement at each scale position would be determined for each statement. Accumulated frequencies and per cents of each statement at each of the eleven intervals were recorded, as well as the median scale values and the Q-values (measures of ambiguity). In addition, a record was kept showing the difference between the median scale value (position 5) of each statement by the first fifty judges and the second fifty judges. Table 1 illustrates the rankings of 100 judges for the first three statements represented in the sample sheet.

TABLE I

RATINGS BY ONE HUNDRED JUDGES

Rankings	Statement 1		Statement 2		Statement 3	
	Frequency	Per Cent	Frequency	Per Cent	Frequency	Per Cent
0	53	53	16	10	0	0
1	13	66	10	26	0	0
2	9	75	13	39	0	0
3	8	83	11	50	0	0
4	6	89	12	62	0	0
5	10	99	23	85	0	0
6	0	99	3	88	0	0
7	0	99	1	89	1	1
8	0	99	5	94	8	9
9	0	99	1	95	14	23
10	1	100	5	100	77	100
Median Ranking	.95		4.00		10.35	
Q-Value, Ranking	2.53		3.67		.95	
Difference	.10		1.80		.20	

Calculation of Correlation Coefficients

In order to determine whether or not a sufficient number of judges had ranked the statements to give a reliable assignment of scale values, the Pearson r was computed between the rankings of the first fifty and of the second fifty judges. This coefficient was .978, suggesting that no more judgments need be added to the 100 recorded.

By means of the Spearman-Brown prophecy formula the judgments for the relative placement of statements on the total scale showed a reliability coefficient of .988. This was sufficiently high to warrant proceeding further with the material. In addition, the mean difference between the judgments of the first and second fifty judges was found to be .582 scale intervals for the original statements and .435 for those retained in the final analysis.

Elimination of Ambiguous Statements

From data of the sort illustrated in Table I it was possible to regroup the statements at each scale position according to their respective Q-values. In this way statements which 100 judges considered to have the least ambiguity (as measured by statistical computation of Q-values, quartile deviation) could easily be selected. For the purpose of the final scale the four statements at each interval having the lowest ambiguity score were chosen. Thus, since a scale of eleven intervals had been used, we would expect to retain forty-four statements. However, there were but two statements lying within the interval from scale position 6 to scale position 7. Consequently, the final selection contained forty-two statements.

Division into Forms A and B

It was then decided to divide the retained statements into halves, twenty-one to appear on Form A and twenty-one to appear on Form B of the final attitude measurement scale. This was done for several reasons: (1) to provide a brief instrument of measurement, (2) to compare the results from one form with those from the other, and (3) to compute reliability scores for each list. The two forms were also combined into a single list in later administration of the scale.

Division of statements was made by choosing two of the four statements retained

at each scale interval for Form A and two for Form B. In order to balance scale values for the two forms the order A B B A, B A A B, A B B A, B A A B, etc., was followed alternately throughout the scale intervals. This selection was made easy by referring to the table drawn up for elimination of ambiguous statements. By so doing Form A contains twenty-one statements having a mean scale value of 5.46 and a mean Q-value (quartile deviation) of 1.89, while Form B contains twenty-one statements with a mean scale value of 5.51 and a mean Q-value of 1.98. The mean Q-value of the total number of retained statements was 1.94.

Q-Values for Different Parts of the Scale

The comparative degree agreement of judges at different scale points was then graphically illustrated for the entire 164 statements, and also for the retained forty-two statements. It was found that ambiguity scores are much larger midway between definitely named positions (0, 5, and 10). The same trends are present for the entire group of statements as for the retained group, the only difference lying in the fact that Q-values at all points have been lowered by the selective factor employed in the elimination of statements.

Regrouping the Data

Graphs were drawn from the statistical data compiled from the judges' ratings to illustrate each type of statement represented in the study. These graphs merely supplemented the statistical data in an attempt to aid in clarifying the amount of agreement of judges on retained statements as compared to eliminated statements. Retained statements were then arranged in an irregular order (median values) on each form so that no definite sequence of attitude would be contained in either form. The first two statements in each form were so placed because of predetermined neutrality to prevent prejudice at the beginning. The statements were finally arranged so that the two forms corresponded at each item. For example, after the statements in each form were allocated and numbered in sequence, each number in Form A (that is, statement 8) would correspond approximately in scale value to that number (statement 8) in Form B.

Final Form of Scale

A sample copy of the final form, combined into a single folder including Forms A and B, along with the instruction sheet is appended. Forms A and B were also printed separately for use where a more abbreviated measure is preferred.

The numerical score for each statement is simply its median scale value; determination of the quantitative nature of the subject's attitude toward nursery schools is to be accomplished by computing the mean scale value of all the statements which he endorses as indicated by his placing of plus signs within designated parentheses. Thus the mean scale value of statements marked plus would be the subject's score. The scale values for each item in Forms A and B of the scale are given in the following tabulation:

Items	Form A	Form B
1	5.5	5.4
2	6.4	6.2
3	9.6	9.8
4	.8	.7
5	3.3	3.6
6	7.4	7.8
7	10.4	10.3
8	3.0	2.7
9	5.5	5.5
10	10.1	10.4
11	3.2	3.6
12	8.8	8.9
13	2.1	2.4
14	9.8	9.9
15	4.4	4.3
16	1.4	1.5
17	1.1	1.4
18	5.0	4.5
19	8.8	8.9
20	.6	.7
21	7.8	7.2

For determination of the qualitative nature of the subject's attitude and also for interpretative purposes, a self-descriptive scale of interpreting statistical scores was devised as follows:

0 to 0.9	Strongly opposed to nursery schools
3.0 to 3.9	Definitely opposed to nursery schools
4.0 to 4.9	Opposed but attitude not strongly set
5.0 to 5.9	Neutral
6.0 to 6.9	Favorable but attitude not strongly set
7.0 to 7.9	Definitely favorable to nursery schools
8.0 on	Strongly favorable to nursery schools

Reliability scores for the scale values as recorded are as follows:

$$q\left(\frac{Q}{2}\right) = .97$$

The standard deviation of the distribution of scale values equals $\frac{q}{0.67}$ or 1.45 scale units. The scale value of an opinion is the median of its distribution on the scale. Hence the standard error of the scale value is: $S.D._{med} = 1.25\frac{S.D.}{\sqrt{N}}$, or $1.25\frac{1.45}{\sqrt{100}}$ or .18 when N equals 100 judges. The probable error of the scale value is consequently: $P.E._{med}$ = .67 times .18 which is .12 scale units.

For the purposes of this report the distribution of attitudes toward nursery schools within seven specific groups will suffice to illustrate the actual process of applying the scale. The seven groups included a seminar unit in child development, a beginners' class in educational psychology, the teaching staff of the University Elementary School, two classes in general sociology, and a class in advanced experimental sociology.

From the statistical treatment of the results of these first applications it was evident that the groups employed were homogeneous to such an extent that keen differentiations of attitudes lying at all points along the scale do not exist for them upon the subject of nursery schools. However, a number of interesting facts were revealed in the distribution of attitudes within the seven groups.

The first four groups, all closely connected with the School of Education and thus with the University Elementary School nursery unit, were considered together. The mean score for these four groups on Form A was 8.22 and on Form B, 8.76. The uniformity of training and experience of these groups precludes much difference of attitude toward their field of specialization. The Pearson *r* for these groups on Forms A and B was found to be .47 ± .06 with a predicted reliability for the two forms of .64.

The remaining three groups, slightly more variable in training and yet still closely allied to educational planning because of their sociological pursuits, were also considered together. Granting such similarities among groups, a suggestion of a trend appeared. The mean score for these groups on Form A was 7.66 and on Form B, 8.17, a slightly less favorable attitude toward nursery schools being representative of these groups. The Pearson *r* between Form A and Form B was .78 ± .02, with a predicted reliability of .88 for the two forms, evidencing a higher reliability within groups varying even so slightly as those employed.

A third Pearson *r* was computed between results on Form A and Form B for the combined group. This coefficient was .72 ± .05 with a predicted reliability of .84 for the sum or average of the two forms. The mean score for all male subjects was 7.60 and for all female subjects 7.85.

There was noticeable congregation of scores around scale values 7 and 8. This may have been due to factors totally apart from reliability or validity of the scale. Outstanding among these factors may be mentioned the possibility that the majority of persons may actually lie in these two positions as regards their attitudes toward nursery schools; the subject of nursery schools obviously does not comprise as radical an issue as such topics as communism, prohibition, or birth control. These positions represent an attitude which is definitely favorable to nursery schools, and yet the mean score is kept down to 8 by the endorsement of criticisms which, by their frequency of occurrence, are proved to be entertained even by persons who in general are strongly in favor of nursery schools. For example, in analyzing the indorsement of antistatements it was found that if the pronursery school raters indorsed unfavorable statements at all they were most apt to indorse the same ones as did most other raters with generally favorable attitudes. To be specific, statements 5, 8, 11, and 13 on Form A and statements 5, 11, 13, and 15 on Form B represent the most popular beliefs opposed to nursery schools, but they are frequently indorsed by persons of comparatively high scores.

Further experimentation will include applications to heterogeneous groups and the determination of the possibility of the measurement of attitudinal changes attributable to observation and child study programs.

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ATTITUDE TOWARD NURSERY SCHOOLS

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Score .....

Name..... Date.....

1. City..... 2. State.....

3. Sex..... 4. Age..... 5. Years of schooling.....

6. Number of children..... 7. Their ages..... 8. Your occupation.....

9. Have any of your children ever attended a nursery school?.....

10. Have you ever been a member of a child study group?.....

11. What magazines on child care do you read regularly?.....

.....

.....

12. Have you ever taken a course in the study of young children?.....

13. Is there a nursery school in your city?.....

14. What is the occupation of the wage earner of the family?.....

15. What is the relation of the wage earner to you?.....

This is a study of attitudes toward nursery schools. On the following pages you will find forty-two statements expressing different attitudes toward nursery schools. Put a plus (+) in the parentheses preceding each statement if you agree with the statement. Put a minus sign (-) in the parentheses if you disagree with the statement. Do not hesitate to express your own opinion freely. This is not an examination.

University Elementary School
The University of Michigan
Ann Arbor, Michigan
1932

FORM A

Be sure to put a plus sign (+) if you agree with the statement, and a minus sign (-) if you disagree with the statement:

( ) 1. The nursery school is good when it aids the child, and bad when it slows him down.

( ) 2. Nursery schools are all right if the teachers are well trained.

( ) 3. Nursery schools encourage expression, and thus aid the retarded child.

( ) 4. I see no value in the nursery school.

( ) 5. Nursery schools are too expensive for the relatively small groups they can accommodate.

( ) 6. Parents value the contributions of the nursery school, while recognizing its limitations.

( ) 7. Self-control, self-development, and self-expression result from nursery school training.

( ) 8. Nursery schools are too often merely teacher-training centers.

( ) 9. Some nursery schools are all right, but others are not.

( ) 10. Nursery school methods are in harmony with the principles of child psychology.

( ) 11. The habit formation of the nursery school does not allow spontaneity.

( ) 12. The nursery school teaches children to appreciate work well done.

( ) 13. Nursery schools over-stimulate the child.

( ) 14. The nursery school gives the children a wider field for the full exercise of their powers than is usually possible at home.

( ) 15. Nursery schools suffer from impatience for tangible and permanent results.

( ) 16. Constant nursery school care softens the child so that any change causes suffering.

( ) 17. A shadow of adversity, a breath of opposition, and the stamina of the nursery school child gives way.

( ) 18. The children who would be best influenced by the nursery school are seldom the ones who attend.

( ) 19. Nursery schools are gradually winning a place for themselves in educational planning.

( ) 20. Nursery schools have no excuse for existence.

( ) 21. I believe the nursery school has satisfying interests for the young child.

FORM B

Be sure to put a plus sign (+) if you agree with the statement, and a minus sign (-) if you disagree with the statement:

( ) 1. The good or bad to be derived from the nursery school depends upon the personality of the child.

( ) 2. Nursery schools are all right when they meet a real need in the lives of the parents.

( ) 3. The nursery school provides healthful conditions and skilled physical care.

( ) 4. Nursery schools create a type of young for whom life is sheer ennui, utter futility.

( ) 5. Nursery schools allow so much freedom that the child finds it difficult to adjust himself to the kindergarten.

( ) 6. Nursery schools lessen the friction between mother and child through frequent separations.

( ) 7. The nursery school makes possible an all-round development of mind and body in an atmosphere of happy companionship.

( ) 8. Nursery schools cause children to "grow up" too soon.

( ) 9. You cannot generalize concerning the faults or benefits of the nursery school because you are dealing with dissimilar factors--human beings.

( ) 10. The nursery school makes possible a better understanding of child behavior.

( ) 11. Nursery school attendance takes away the mother's delight in hourly contacts with her child.

( ) 12. Nursery school methods are rapidly improving the educational treatment of older children.

( ) 13. The varied equipment in the nursery school leaves too little motivation for resourcefulness (making something out of nothing).

( ) 14. The nursery school aids in social adjustment.

( ) 15. Nursery school environment is stimulating, but the necessary group supervision hinders initiative.

( ) 16. The nursery school makes little robots.

( ) 17. Nursery school children become slaves to routine.

( ) 18. The nursery school child insists on being both seen and heard.

( ) 19. The nursery school helps the child to overcome shyness.

( ) 20. I would certainly never send my child to nursery school.

( ) 21. Young children are innately depraved; education corrects these evil tendencies.

AN INVESTIGATION OF THE FEEDING, SLEEPING, CRYING, AND SOCIAL BEHAVIOR OF INFANTS

by
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Iowa City, Iowa

STATEMENT OF THE PROBLEM

The purpose of the present study was to investigate the feeding, sleeping, crying, and social behavior of a group of young infants reared in a fairly constant environment. Specifically, the problems were:

1. To obtain information on certain aspects of the feeding situations of each infant by means of observation records made by an observer

2. To obtain information on sleep of the infants by means of: (1) records kept by an observer on each infant while he was going to sleep and while he slept during the daytime; (2) records of length of sleep, probable causes of wakefulness, and treatment of wakefulness made by the observer during two-week periods of night sleep; and (3) records on each child, kept daily by nurses on duty in the laboratory throughout the period of infants' stay in the laboratory, showing time of sleep and length of sleep

3. To obtain information on the crying behavior of infants by means of records taken during periods of the day when crying was most frequently observed

4. To obtain records on the behavior of the infants in situations where another infant or infants were near, and to separate from these records the behavior which seemed to involve social interactions with other infants or adults and to analyze it

DESCRIPTION OF THE SUBJECTS AND THEIR ENVIRONMENT

The six subjects studied in the present investigation with one exception[1] were indigent male infants, who for social or economic reasons were released by their mothers to become wards of the state or of orphanages. All were physically normal infants living in the metabolism laboratory of the Iowa Child Welfare Research Station at the State University of Iowa.

Before admission, each child was given a complete medical examination. The age upon admission ranged from nine to twenty-three days, the oldest infant remaining in the laboratory until he was nine and one-half months old, the youngest until he was six and one-half months, and the remaining until they had reached the age of eight, eight and one-half, and nine months. Daily weight records and physical growth records were kept at regular intervals. The infants were contented and happy. All were above average in weight, as measured by the Finkelstein[2] formula, at the seventh and eighth week of life and remained above average during the remaining time spent in the laboratory.

The Iowa Child Welfare Research Station tests[3] for young children, aimed at giving a description of the mental development of the infants, were given the subjects with the following results:

1. This exception was a child of one of the better families in the local community whose mother had died when he was three days old.
2. Cited by Daniels, A. L., Hutton, M. K., Stearns, G., and Hejinian, L. M.: Relation of rate of growth in infants to diet. Amer. J. Dis. Child., 1929, 37, 1177-1186.
3. These tests are in the experimental stage; consequently only tentative norms are available. Intelligence quotients falling within the range of 90 to 110 are considered average; under 90, below average; and above 110, above average. Chronological ages in the following tabulation are corrected to the nearest month. For example, if a child's age is four months, fifteen days, his age is indicated as four months; if his age is four months, sixteen days, it is indicated as five months. Elsewhere in this study the second month refers to the period from the infant's second monthly birthday to his third monthly birthday.

Child	First Test		Second Test		Third Test	
	Chronological Age, Months	Rating	Chronological Age, Months	Rating	Chronological Age, Months	Rating
M1	7	Above Average	8	Average	10	Average
M2	6	Above Average	8	Above Average	10	Average
M3	5	Above Average	7	Above Average	9	Above Average
M4	5	Average	7	Average	9	Average
M5	4	Above Average	7	Above Average	8	Above Average
M6	5	Above Average				

Judging the infants by these results, it appears that they were average and above average in mental status.

While the infants were housed in the metabolism laboratory, primarily as subjects for metabolic studies, they served also as subjects for collecting data for the present investigation. The metabolic studies which were carried on consisted of a program of collecting urine and feces for chemical analysis while the infant was on a given diet. This was accomplished by placing the infant on a specially devised bed for a period of seventy-two hours at about one-month intervals following the second or third month of life.

No unusual or abnormal conditions were evidenced while an infant was on the metabolism bed. He was moved from one room to another to give him different views of activities taking place on the outside. Toys of various kinds were suspended within his reach so that he had something with which to play, and the other children were brought near in their high chairs in order that social contacts with them should not be interrupted. If a child became tired while on the metabolism bed, he was bathed and massaged and talked to in a tone of voice that was intended to convey the message that all was well.

INFANT BEHAVIOR AND ADULT PROCEDURE IN FEEDING SITUATIONS

After several months of observing those aspects of infant behavior which seemed most significant, certain items in feeding, sleeping, crying, and social situations were chosen for investigation. In general, the items which were selected included the behavior of the infants and the procedures used by those who cared for the infants in these situations.

RECORDING FEEDING BEHAVIOR

The record form for feeding observations was devised with groups of items, and was drawn up so that the occurrence of any behavior could be noted by a check. From the point of time the blank was arranged in three major divisions: one minute prior to the giving of the feeding termed the "pre-minute" period, one minute or less while the bottle was being given to the child called the "giving" minute, and one minute while the infant took his feeding called the "post" period.

The items included in the feeding blank were divided into four major divisions:

1. The infant's reaction to feeding, including the condition of eyes (open, closed, or partly closed) and the position of fingers, arms, and trunk
2. His reactions to bottle, such as grasping, looking at, and holding
3. His reactions to the adult, such as watching adult while taking food and vocalizing while taking food
4. The last group of items consisted of the adult's procedure in

dealing with the various aspects of infant behavior in the feeding situations, such as stimulating the child, giving the bottle a second or third time after the initial giving, or changing a collapsed nipple.

During a preliminary training period in the use of the blank, the writer and one other observer[1] memorized the items, planned the methods of procedure, and worked out definitions for certain items upon which they had disagreed.

Twenty-two observations were made to determine the reliability with which the blank could be used. The observers stood side by side, from two to three feet from the child's head. As soon as one observer gave the infant the bottle, the other started the stop watch and placed it on the bed. At the beginning of each minute period of observation the first observer called the time, and throughout the minute the other observer called off the items, in sequence, for observation. This was done so that the two observers would be able to look at the child for a given behavior at the same time.

The observations for determining reliability covered a period of 152 minutes. The results on the items as listed individually on the blank forms showed an agreement ranging from 82 to 100 per cent. The percentage of agreements on the five groups were as follows:

Item	Mean	Probable Error of Mean
Reaction to feeding	95.0	.81
Reaction to bottle	98.3	.20
"Giving" minute	92.2	1.37
Reaction to adult	99.2	.36
Adult procedure	97.0	.72

ANALYSIS OF FEEDING OBSERVATIONS

The material forming the data from which conclusions concerning the feeding situations of the six infants were drawn consisted of 158 observations. The average number of observations for one infant was 28.1. The number of minutes of observation for an infant ranged from 149 in the smallest number of observations to 284 minutes in the largest number.

Although the preliminary feeding observations were begun relatively early, in most cases at the fourth and fifth month of life, the observations used were those collected after the observers had carried on considerable practice in the recording, and were taken largely from the sixth, seventh, eighth, ninth, and tenth months of life. The intervals of time at which observations were made on a given infant ranged from one to six days and averaged 3.4 days. No feeding observations were made while the metabolism studies were in progress.

Average Frequency of Feeding Behavior Items Occurring Within an Observation Period Separately and in Combination

The feeding records were analyzed for frequency of items occurring separately or in combination for the series of pre-minute and post-minute observations.

Any group of items descriptive of one member of the body, such as of the eyes or the arms, and the group of items descriptive of the child's reactions to the bottle are in this analysis called a subgroup. When only one group of items in a subgroup occurred within a pre-minute or throughout the series of post-minutes, it was tabulated as a single occurrence. When more than one item in a subgroup of items was observed within a pre-minute or within a series of post-minutes, they were tabulated as a combination of items.

Condition of Eyes During the Feeding Period.- During the pre-minute series the average frequencies for one observation of the item eyes open ranged from .82 to .97, partly closed from .03 to .15, and closed from .03 to .14. The infants, generally speaking, had their eyes open during the minute previous to the giving of the bottle.

In the series of post-minutes those items showing the higher frequencies

1. Throughout this study, Esther Van Cleave Berne, Ph. D., assisted the writer in making observations.

separately and in combination were: eyes open from .46 to .74; partly closed from .06 to .04; open, partly closed, and closed from .03 to .33; open and partly closed from .04 to .24. It is apparent that the infants, in general, kept their eyes open while they were taking their feedings in more than half of the observations.

Condition of Arms During Feeding Period.- The average frequency for an observation for arms being up during the pre-minute series ranged from .81 to 1.00. Other positions of the arms during this period were very low. The highest frequencies for items during the post-minute series were for arms up (.74 to .92) and arms up and down (.03 to .18). The position of arms up, therefore, is seen a large per cent of the time during feeding observations.

Condition of Fingers During Feeding Period.- In the pre-minute series the highest average frequencies in items describing conditions of fingers were for "clinched" fingers (.03 to .14) and "plays with towel" (.09 to .46); and in the post-minute series, "plays with towel" (.61 to .80). Although movements and clinching of fingers in the pre-minute series occurred infrequently, playing with the towel occurred in more than half of the post-minute series.

Position of Head During Feeding Observation.- For position of the head in the pre-minute period the following showed the highest frequencies: head right (.27 to .74), head left (.16 to .53), and head right and then left (.13 to .14). Highest frequencies in the post-minute series were for the items head right (.18 to .77) and head left (.23 to .82). It is evident that the infants tended to take the position head right more frequently than head left. Whether the infants took their feeding from the right or from the left side probably was largely determined by previous feeding and sleeping positions.

Position of Body During Feeding Observation.- In the pre-minute observations, movements of the body occurred with an average frequency of from .38 to .79; tenseness, with frequencies from .06 to .09; and movements ending in tensions from .06 to .12. Only movements of the body showed significant frequencies in the post-minute series, the averages ranging from .18 to .44. It should be observed that movement was relatively more frequent in the feeding period than was tenseness.

Post-minute observations gave the following average frequencies for reactions to bottle: stopping before finished .65 to 2.79, turns from nipple .04 to .35, crying .03 to .17, tenseness .71 to .74, and relaxing .74 to .77.

Reaction to Adult During Feeding.- Reactions to adult were recorded only during the series of post-minutes. Those items of behavior which were shown by each of the six infants were: watches and continues to eat (2.14 to 2.26) and watches and stops eating (.14 to .74).

Adult Procedure During Feeding of Infants.- Adult procedures were recorded only during the series of post-minute observations. Items showing the highest frequencies were: giving bottle (.29 to 1.96), tipping up the bottle (.23 to .71), changing nipple (.03 to .13), fixing a collapsed nipple (.12 to .38), turning the child (.03 to 2.00), and stimulating the child (.31 to 1.80).

Expressive Behavior During Feeding Observations.- The highest average frequencies of expressive behavior in the pre-minute period were for crying, grunting, and smiling; and in the series of post-minutes grunting and smiling followed by grunting. It is to be noted that crying occurred in somewhat less than half of the pre-minutes, while grunting occurred infrequently. However, in the series of post-minute observations, grunting occurred frequently and crying rarely.

Reaction to Bottle During Feeding Observations.- Reactions to bottle were treated in two divisions--reactions occurring during the giving of the bottle (the giving period) and those occurring during the series of post-minutes. During the giving period the average frequency of the infants' looking at the bottle ranged from .97 to 1.00, for opening the mouth for bottle arrangement .94 to 1.00, for grasping the bottle .76 to 1.00, for drawing on nipple 1.00, for tenseness .71 to .82, and for relaxing .74 to .82. Observation of the above items was made only on crying,

tenseness, and relaxation during the series of post-minutes.

INFANT BEHAVIOR AND ADULT PROCEDURE IN SLEEPING SITUATIONS

Observations of the infants' sleep were carried on similarly to those in feeding situations. Three types of records were used in obtaining data for sleeping situations: (1) a record of twenty-four hours for day sleep, night sleep, and total sleep; (2) a form which included notations on the child before he slept, while he was going to sleep, and while he slept; and (3) notations kept during two-week periods of night sleep.

TOTAL DAY AND NIGHT SLEEP

The data for the record on day and night sleep were collected by the three nurses who cared for the infants, alternating at regular intervals. The nurses were able to observe them about every five minutes. Notations were made of the time at which awakening and going to sleep occurred. Although it was felt that there was some error as to the correctness of the record, this probably did not exceed five or ten minutes either at the beginning or end of the sleeping period.

In the daytime the infants tended to sleep less with increasing age. Day sleep dropped from the second to the seventh month in amounts ranging from 2.7 to 4.6 hours. With one exception, the infants tended to increase their night sleep by approximately one hour from the second to the seventh, eighth, or ninth month. Total sleep during a period of twenty-four hours tended to decrease for each infant with age. This decrease ranged from 1.5 to 3.2 hours.

NIGHT SLEEP

Recording Night Sleep

The record blank for night sleep was drawn up for noting certain aspects of night sleep, such as information on total sleep, wakefulness, and probable causes of wakefulness. The writer cared for the infants at night during two-week periods at six-week intervals. Although not always at the bedside of the infants, she was close enough to know if awakening occurred. Notations were made, therefore, on the length of night sleep, on the number of times of being awake, on the total time awake, and on probable causes of wakefulness.

Length of Sleep and Length and Frequency of Wakefulness During Two-Week Periods

The means, standard deviations, and probable errors of means for length of sleep between 7:30 P.M. and 6:00 A.M. for the six infants during three two-week periods are given in the following tabulation:

Child	Mean	Standard Deviation	Probable Error
	First Two-Week Period		
M1	9.7	.23	.04
M2	9.5	.47	.08
M3	9.6	.39	.07
M4	9.5	.43	.08
M5	100.0	.47	.08
M6	9.4	.81	.15
	Second Two-Week Period		
M1	9.9	.26	.05
M2	9.7	.61	.11
M3	10.0	.35	.06
M4	9.9	.40	.07
M5	10.0	.30	.06
M6	10.0	.00	.00
	Third Two-Week Period		
M1	10.0	.13	.02
M2	9.6	.52	.10
M3	9.9	.47	.09
M4	9.9	.30	.06
M5	9.9	.39	.07
M6	9.9	.54	.10

A comparison of the means of the first two-week period and of the third two-week period was made for three infants (M1, M4, and M6) in order to determine whether or not the difference between the means was statistically significant. According to the method used by Fisher (5) for determining the significance of the differences between means based on small numbers of cases, M4

alone showed a statistically significant increase in length of sleep over a period of eighteen weeks.

The nightly average frequency of wakefulness for an infant ranged from .2 to .6, with an average for all infants of .4. For the different probable causes of wakefulness the following show the highest nightly frequencies: restlessness, being tired, being thirsty, and wanting attention.

An analysis of the length of time of wakefulness in relation to probable causes for six children during forty-two nights showed the following result: The average length of time awake during a night for six infants ranged from .02 to .07 hour, with an average for all infants of .05 hour. The different probable causes showing the highest average length of wakefulness per night per child were as follows: being hungry, being tired, and being restless.

FALLING-TO-SLEEP PERIOD

Recording and Observing the Period

The form for collecting the data on falling to sleep was drawn up to include information on the behavior of the infant immediately preceding sleep, while the infant was going to sleep, and while he slept. The blank was arranged for checking the items each minute of the period of observing.

Records for determining the reliability of observations were made by two observers. After a preliminary period of training in the use of the blank, which included training for agreement on definitions of items, observations were made covering ninety-six minutes. The percentages of agreement between the observers for the pre-sleep and the post-sleep periods were as follows:

Period	Mean	Probable Error of Mean
Pre-sleep	98.6	.94
Post-sleep	98.5	.30

Analysis of Observations on Going to Sleep

One hundred eight observations were made on going to sleep, with an average of eighteen for each child. The greatest number of observations on one child was twenty-five and the lowest ten. The number of minutes of observation ranged from 135 to 297. The data on sleep were collected during the sixth, seventh, eighth, and ninth months of life, with intervals between observations on the same child ranging from one to eight days and with an average for all children of 2.9. The time of day during which these data were collected was about equally distributed between morning, evening, and afternoon periods.

Sleeping Behavior During Falling-to-Sleep Period

Condition of Eyes.- In the subgroup of items describing the condition of the eyes, the following have the highest frequencies: closed (.13 to .37), closed followed by partly closed and closed (.07 to .40), partly closed and closed (.05 to .44), partly closed (.12 to .48), and open followed by partly closed (.04 to .20). With most of these items the individual variations in the pre-sleep periods were great. The items of the post-sleep period showing the highest frequencies were: closed (.66 to .92), closed followed by partly closed and closed (.08 to .30), and partly closed and closed (.07 to .19). It is evident that in more than half of the post-sleep minutes the infants' eyes were closed.

Frequencies of Bodily Movements.- During the pre-sleep period, bodily movements occurred with frequencies ranging from .44 to .76. Movements observed during the post-sleep period are reported later in this discussion.

Expressive Reactions.- Expressive reactions, which included gurgling, smiling, vocalizing, and crying, occurred only during the pre-sleep period. Grunting was observed with an average frequency ranging from .12 to .37, crying from .06 to .2, and crying followed by grunting from .04 to .20. It should be noted that expressive reactions occurred relatively infrequently during the pre-sleep period.

Position of Arms.- The condition of arms, fingers, legs, and head and body movements were recorded in the post-sleep period. The highest and most significant

frequency for position was for arms up (ranging from .60 to .90). The highest average frequencies for all other positions were .10 or below.

Position of Fingers.- The following items had the highest average frequencies observed on position of fingers: extension (.40 to .60), clinched (.09 to .50), and clinched followed by extension (.20 to .38). It appears that extension of fingers occurred more frequently than any other position of fingers.

Position of Legs.- The following items describing the position of legs received the highest average frequencies: extension (.60 to .94), flexion (.08 to .13), and flexion followed by extension (.04 to .24).

Position of Head.- The highest average frequencies describing position of head were as follows: head right .14 to .60, head left .08 to .64, on face .06 to .18. For three children head right occurred more than half of the time, while for the other three children the position head left occurred almost as frequently. This may have been due to the fact that each infant's preferred sleeping position was changed at regular intervals. This was accomplished by feeding the child from, or turning him in his sleep to, the side which he did not favor.

Body Movements.- Items observed in describing the movements of the infants while sleeping showed the following as highest in frequency: jerky followed by quiet (.09 to .80); jerky (.04 to .20); quiet (.22 to .57); jerky, quiet, jerky, quiet (.04 to .19). It is evident that there was considerable individual variation in frequencies of occurrence of items which describe the movements of the infants during the post-sleep period.

INFANT BEHAVIOR AND ADULT PROCEDURE IN CRYING SITUATIONS

BLANK FOR RECORD ON CRYING

Records for crying were prepared similarly to those for feeding and sleeping. The blank was drawn up to include items on onset and cessation of crying, description of crying, probable reasons for crying, adult procedure or treatment, if any, in crying situations, and situation of infant (whether in bed, on the floor, or in a chair). The blank was arranged for checking the items each minute of the observation period.

The observer stood within a distance of three or four feet from the child. Having previously memorized the list, she recorded item by item consecutively during a given minute, looking first at the stop watch, then at the child, and then at the record blank and stop watch.

ANALYSIS OF OBSERVATIONS ON CRYING

The data on crying were collected in 115 observations, ranging from twelve to twenty-three observations, and from sixty-eight to 197 minutes per child. The data were collected between the sixth, seventh, eighth, and ninth months of life at intervals, for a single child, on an average of 2.7 days. The observations were made during the daytime and at periods when crying was most in evidence. These periods occurred just before feeding and before the infants went to sleep for the night.

Situation of Child

Of the items describing the situation in which the child was found while crying, the following showed the highest average frequencies: "in bed" ranged from .52 to .83, "in bed" followed by "being placed on the floor" .05 to .19, and "in bed" followed by "being placed in a chair" .05 to .21. It should be noted that more than 50 per cent of the crying occurred while the child was in bed. Crying while the infant was in a chair or on the floor was infrequent.

Position of Hands

The following were the highest frequencies found in the observations of positions of hands during crying: down, up, down, up ranged from .09 to .13; up, down, up .04 to .64; down and up .09 to .79; and down, up, down .05 to .73. The frequencies indicate that there was great individual variation in the position of the hands

during crying. It appears that each child was characterized by an individual type of reaction.

Quality of Cry

The highest frequencies of items descriptive of the quality of crying were: loud and intermittent .05 to .28, loud .09 to .43, whimpering .04 to .43, intermittent and moderate .08 to .30, and whimpering and intermittent .04 to .14. The infants evidenced a fairly large number of qualities of crying, and each differed greatly from every other infant in these qualities.

Probable Causes of Crying

Probable causes for crying which had the highest average frequencies were being tired (ranging from .50 to .75) and being too warm (ranging from .23 to .43). Wanting attention, having gas pains, and being wet appeared infrequently as probable causes for crying.

Situations in Which Crying Ceased

The following were the highest average frequencies of items descriptive of situations in which the infants ceased crying: nurse neared bed ranged from .04 to .43, infant fed .07 to .23, bathed .04 to .17, placed on floor .05 to .14, being patted .05 to .30, changing position .04 to .17, and being taken up .13 to .26.

SOCIAL BEHAVIOR OF INFANTS

METHOD OF OBTAINING RECORD AND ANALYZING BEHAVIOR IN SOCIAL SITUATION

The observations from which the social behavior data were taken were made by an experienced observer over the period from February 28 to July 8. Only a few of the observations fell before May 4. The observer made her record while seated within three feet of the infants. She attempted to record in longhand the overt behavior of two infants playing near each other. On the right half of a sheet of paper she recorded the behavior of one child and on the left half, the behavior of the other child. On two occasions she observed three children simultaneously, and once, five children.

The reason for the observer's attempting to record a large part of the overt behavior of the children was that it was not possible to determine, during the recording, what behavior should be designated as social. That an item of behavior was social was sometimes not evident until it had been repeated several times or was considered in relation to behavior immediately preceding or immediately following.

A fifteen-minute period of observation was planned. There was a total of 131 records for the group of infants. Absorption in the recording or a desire to cover exceptionally interesting behavior sometimes caused the observer to extend the record beyond fifteen minutes.

The handwritten observations were typed. The observer and the writer read parts of them to determine what behavior should be designated as social. They jointly analyzed certain parts of the observations, naming each single occurrence of behavior which seemed to be social.

The term "social behavior" was finally defined for use in this study as "any behavior which appeared to be directly influenced by the presence or activity of another person, either infant or adult."

In reading the observations, it appeared that perhaps a child was often evidencing social behavior when, although he was not looking at, touching, or playing with another person, he was vocalizing, smiling, smacking, or gurgling near an adult or child. For example, an infant might look at another infant, and then, turning his eyes toward his own toy, might vocalize. If such behavior as vocalizing, smiling, gurgling, or smacking occurred within four items of behavior which were definitely social, it was tabulated as social.

ANALYSIS OF SOCIAL BEHAVIOR OF INFANTS

The data on which the present results are based consist of 131 fifteen-minute observations for the six infants. The behaviors which have been included are limited to the following types:

Type 1	Type 2
Vocalizing	Bouncing up and down
Smiling	Breathing hard
Giggling	Making a "funny mouth"
Gurgling	Wrinkling up nose
Smacking	Waving arms
	Kicking
	Coughing
	Blowing

The behavior grouped under the first type often occurred closely connected with looking at, touching, and hugging another infant. In the behavior included in the second type, the child appeared to the observer to be making a definite effort to attract the attention of persons near or to entertain them.

Although there is great individual variation as to the items of behavior evidenced and as to their frequencies, the infants tended to show high average frequencies for the following: vocalizing (near others), looking at adult, looking at child, and smiling at adult. A comparison of the total amount of social behavior evidenced for the same months of life also shows great variation. The significance of these findings should not be overestimated. Since there were only small numbers of observations within each monthly period, the averages for the children are probably not very reliable.

SUMMARY AND CONCLUSIONS

The purpose of this study was to develop and apply reliable methods of observing the feeding, sleeping, crying, and social behavior of a group of young infants.

For information on various aspects of the feeding situation, observations were recorded at minute intervals throughout the feeding period over a period of three months. An average of twenty-eight records was made for each child. The sleep of the infants was investigated through records obtained on total daily sleep, the falling-to-sleep period, and the night sleep during two-week periods. One hundred fifteen records on crying were made during periods of greatest frequency of crying. The total behavior of the infants, in pairs, was recorded for 131 periods covering 1,965 minutes. From the data collected, the behavior involving the interaction of the infants with other persons was separated and analyzed.

The subjects were six normal male infants whose ages, while under observation, fell within the range of nine days to nine and one-half months. The infants were average and above average in intelligence.

The following are the most important results of the investigation:

1. In the pre-minute period of the feeding situation and in the series of post minutes, the infants held their arms off the flat surface of the bed or above the line of the shoulder during more than 74 per cent of the observations. The infants tended to have their eyes open in both periods. The infants tended to turn their heads toward the right in taking their food. This was perhaps influenced by previous positions taken during feeding and sleeping.

2. In the feeding situation expressive behavior showing highest frequencies during the pre-minute period was crying and grunting and in the series of post-minutes, grunting and smiling followed by grunting. For the group of infants studied, the behavior pattern of grasping the bottle appeared between the beginning of the fifth and the end of the eighth month of life.

3. It might be observed from the study on sleep that a given type of behavior often varied greatly with the individual, while others were found to be more characteristic of all the children. The data seem to show that there was a marked tendency for normal infants to sleep with their arms up, that is, out from or above the shoulder line. Arms down by the side when asleep were observed to be more characteristic of the infant who is ill.

4. The results of the study on crying show that the infants evidenced a fairly large number of qualities of crying, and that each differed greatly from every other infant in these qualities. Amounts of crying, as well as the probable causes, again showed wide individual differences.

5. The infants tended to vary greatly in the specific items of social behavior

evidenced and in the frequency of these items. However, since the number of observations for each child was small, the quantitative report of these social behavior data should not be given much consideration.

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A PHONETIC STUDY OF YOUNG CHILDREN'S SPEECH

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INTRODUCTION

The problem of children's use of speech sounds is one which has had considerable intrinsic interest from early times. Buffon (1) in his Natural History gives an account of the prevailing opinions and observations of his own day on this question. We find occasional observations on speech sounds among the classical observations on children's speech development, notably that of Preyer (7) and Sigismund (8). A recent account using the phonetic methods of the present day has been the individual study of Holmes (3). Most significant is the group study of Wellman and others (10).

It need hardly be urged that a fact finding program is a necessary preliminary to the understanding of children's speech development. Moreover, the practical importance of such a program may scarcely be overestimated and need scarcely be mentioned. It is sufficient to cite that the importance of speech in guidance work has been stressed by Ide (4) and others. Moreover, in the present report it will be possible to show that the facts of speech sounds have considerable bearing on some of the most important phases of developmental theory.

The limitations of this approach, however, should be recognized clearly and frankly. The mental test material, in its characteristic form, is not adapted to the youngest children. Mental tests for children below the preschool level are clearly different both as to content and method from tests for preschool and school children. It is to be hoped, of course, that the findings of the present study or of similar studies will enable us to proceed to a program which will produce data for younger children comparable to the data used in the present study for the nursery years.

The investigation for this paper was made with the children enrolled in the Institute of Child Welfare Nursery School at the University of California. The nursery school regimen, essentially the same as that in effect at the time of the investigation, has been described by M. Jones (5). This study was begun at the nursery school in January, 1933, and data collection was finished in March, 1933. The ages of the group studied lay between twenty-six and fifty-six months, with a mode at forty-five months. A total of twenty-five records was available for final analysis.

Another group of the same age and number, attending the Children's Community on Walnut Street, in Berkeley, California, were studied in order to provide a check on the data secured for the first group.

The children at both the nursery school and the Children's Community are somewhat above average in intelligence and as regards the income of their parents. The intelligence quotients at the Institute of Child Welfare Nursery School average about 115 from year to year, substantially above the mean level for the general population.

SPEECH SITUATIONS

In recording the speech of children a more precise technique must be used than that provided by the regular English alphabet. It needs no elaborate plea to show how inadequate the ordinary alphabet is. The alphabet lacks symbols for some very common sounds, such as the glottal stop, which children produce very frequently. But most

significant is the fact that the regular alphabet is ambiguous when used to symbolize sounds. For example, vowel sounds are different in the following words which employ the one letter of the alphabet, a, late, father. In phonetic transcription, the difference of the vowel sounds is shown by the symbols ei (in late) and a (in father).

In this study of the speech of children we have accordingly used a phonetic transcription rather than the orthography of the regular alphabet. The symbols used are basically those of the International Phonetic Association[1] which differ from the regular English alphabet in the principle that one symbol is used for each significant sound. We shall refer hereafter to these significant sounds which we transcribe by separate symbols as "phonemes." (For example, the vowel a as in father, the consonant ð as in this, or θ as in through are phonemes.)

After some experimentation in transcribing the speech of children while they were playing (spontaneous speech) and in transcribing speech which was in response to pictures shown to the child, the latter method was adopted as being more convenient for the purposes of the investigators. The recording was done in a private testing room with the experimenter alone with the child. The child was shown one picture after another, ninety pictures being used in all. Each picture was a colored, clear representation of some familiar object. The child was asked to name the picture. A phonetic record was made of each vocalization, whether it was pertinent to the pictures or not.

Only the significant part of the resulting record is analyzed in this report. As far as words are concerned, only those words were used which were recognizable as some sort of approximation of an English word suggested by the picture shown or by the general context of the situation. The response did not necessarily need to be the correct word for the picture. Thus, hɔs is obviously a good approximation of the English word "horse." If hɔs is said in response to the picture of a cow, it was assumed that the child had confused a cow with a horse but that this confusion did not affect the linguistic value of his response. In short, the child tried to say "horse." But when the experimenter could not determine what the child tried to say, the questionable response was eliminated from the analysis.

The following tabulation gives the names of objects in the picture series:

Number	Object*	Number	Object*
1	fan	10	fork
2	racket	11	sheep
3	flying goose	12	spoon
4	water glass	13	touring car
5	mouse	14	iron
6	walnut	15	pliers
7	bicycle	16	dog house
8	compass	17	carrot
9	burro	18	duck

1. These are the symbols which are used in almost every work on language from such widely used textbooks as the French Grammar of Frazier and Squair and the popular books of Jespersen to such special works as the modern dialectic studies. Some dictionaries still use the awkward system of diacritic marks with the usual alphabet letters, and scholars working in Semitic languages and in American Indian languages use independent phonetic systems for transcribing their sounds. The differences are limited to a few symbols, however, mere matters of detail which do not affect the fundamental principle of transcribing each phoneme with one symbol.

The phoneme symbol thus employed has reference primarily to a given language, in the case of the present study, to English. Phonetic transcription is so flexible that more than the significant sounds may be recorded if desired. Some initial experimentation was carried out in this respect in recording the speech of children. It was found that the variation within a phoneme is greater for children than for standard adult speech. For example, where an adult will always pronounce an initial plosive (p, t, or k) aspirated, that is, with a slight puff of air after the consonant proper has been said, children sometimes do this, sometimes pronounce these plosives unaspirated, and in a few amusing cases even glottalize the plosive, that is, the release of the closure made by the tongue is accompanied by a synchronous opening of the glottis. Such glottalized plosives do not occur in normal English speech but are characteristic of many American Indian languages. However, so long as children would pronounce t, for example, without voicing it, it was counted as correct. The analysis does not take into account variations within the phoneme, such as lack of aspiration, glottalization, retroflex formation, and relative forward and backward position. On the other hand, when the child's articulation of t was voiced, for example, and therefore was confused with the phoneme d, then this fact was entered into our analytic record. (The chief exception to this is our consideration of the glottal stop which is not phonemic in English but extraordinarily conspicuous in the speech of children.) In short, our treatment is phonemic, and variations within the phoneme which children make are so slight that they would probably not even be observed by parents and teachers in general.

Number	Object*	Number	Object*
19	book	55	dog
20	drum	56	traveling bag
21	monkey	57	castle
22	baby rattle	58	straw hat
23	mirrored cabinet	59	butterfly
24	rooster	60	basket
25	barrel	61	dirigible
26	apple	62	trumpet
27	rose	63	hammer
28	scissors	64	baby carriage
29	slippers	65	pipe
30	slate	66	watering can
31	windmill	67	chair
32	locomotive	68	strawberry
33	horse	69	bear
34	cannon	70	parrot
35	nippled bottle	71	pear
36	cat	72	goat
37	boy flying kite	73	bell
38	key	74	camel
39	reindeer	75	doll (girl)
40	scales	76	umbrella
41	brush	77	clown
42	lion	78	olive
43	pen knife	79	wheelbarrow
44	top	80	church
45	fish	81	diamond ring
46	comb	82	sailboat
47	cherries	83	bird cage
48	rifle	84	lamp
49	clock	85	pig
50	chessboard	86	silver urn
51	swan	87	rabbit
52	violin	88	tub with water
53	elephant	89	pistol
54	table	90	egg cup

*The above pictures were published as the "Familiar Object Game" by C. H. Stoelting Co., 424 North Homan Avenue, Chicago, Illinois, and were listed by the catalog number 3213. They are described as being a member of the series of "Spear's Games."

VARIETIES OF PRONUNCIATION

One thinks of different pronunciations as being a matter of different dialects of the same language (as New York English and London English), and of individuals as having a consistent pronunciation. This pronunciation of the individual, it is commonly thought, not only indicates what part of the country he comes from but also tells something about his character. In the theater, for example, it is an important part of an actor's technique to adopt a consistent pronunciation for the part he is characterizing.

All of this is relatively true for adults. Most adults do have a fairly consistent pronunciation. It is not so with children. The child may seem to be making only rough approximations of a prototype word, and while the mistakes in the approximations may be repeated often enough in some cases to characterize the child, the mistakes and occasional perfect productions of the prototype word are more frequently made in an unpatterned fashion. In short, the child does not have a consistent pronunciation. For example, for two different pictures of a house, the response may be first hauf (in which the f sound is substituted for the correct s) and secondly hauʃ (in which the ʃ sound as in ship is substituted for the correct s). In order to check this point in reference to direct imitation of a spoken word, the investigators have tried to call out verbal reactions from the child by accompanying simple acts with appropriate words. The child would imitate the spoken words for objects, but just as when the child spoke spontaneously or gave the name of a picture without the spoken word as a model, his approximation of the word might be different when repeated. Some words, it would seem, frequently are repeated in self-correction.

We may conclude that in all circumstances the particular form of an English word which a child approximates is not fixed. When a child says hauf for house, it does not mean that the child will (even for the time being) always say hauf for house. In other words, it would be improper to regard the records as so many fixed individual speech profiles. To secure a profile picture of a given child's speech, an attempt would need to be made to get an exhaustive list of all the approximations which a given child makes for a given word, and the comparative preference given to one approximation as opposed to another. In short, the approximations of children's forms, as hauf for house, are not comparable to fixed dialect forms in reference to a standard language. For instance, a good Yorkshireman will always say kum for kʌm (come) of Standard English and not have a variable repertory.

TERMS USED IN THE DESCRIPTIVE TABLE

As a unit of study, the "phoneme" is used. A phoneme is a group of similar sounds, usually clustering about a single type sound, which is phonetically equivalent. Thus, a in father may vary considerably without producing any feeling that a different word is being spoken.

The following types of variation from normal adult pronunciation are readily recognized: (1) Elision refers to the omission of a phoneme. In the examples below, the consonants listed opposite the term "elision" are those which have been left out of words. Thus, when a child says hau for house (phonetically, haus), the final s sound which properly belongs to the word has been left out and is, therefore, placed opposite the term "elision." (2) Intrusion refers to a superfluous inclusion of a phoneme. When a child says hausθ for haus (house), the final θ sound does not properly belong to the word house. The child has used more than enough sounds, and the intrusive sounds are placed opposite the term "intrusion." (3) Substitution refers to an incorrect exchange of phonemes. When the child says hauf for haus (house), the f sound has been substituted for the correct s sound. It is important to know first of all what phoneme the child actually used (f in the case of hauf); this incorrect or substituted phoneme is derived from the correct phoneme, that is, from the phoneme which should be used for the word in question (s in the example). The correct phonemes which were not but which should have been used are placed to the right of the symbol < (derived from), while the substituted phoneme which the child actually used is placed to the left of the symbol <. According to the example, the sound should be recorded as f < s, that is, f, the substituted consonant, is derived from s, the correct phoneme in the word house. (4) Another type of variation is known as scatter. The numerals enclosed in parentheses show at a glance the total number of the different consonants encountered in the record which has been elided, which has been intruded, or which has served as correct models for the substituted phoneme. For example, in one series below, f was substituted in different words for which the correct consonants should have been s and l and ʃ, that is, f was substituted for three different consonants. These consonants are the scatter of f. (5) Rank is the fifth type of variation. Among phonemes which are listed in series in the following tabulations, the first is given primary position because it was found to be elided, intruded, or serving as the correct model for the substitution more frequently than the second, the second more frequently than the third, and so on. A more definitive ranking, showing the percentage of a given consonant in relation to the total opportunity, is treated at a later time. So far as the following tabulations are concerned, the scatter, that is, the number of different kinds of phonemes, is more significant than the ranking within a given scatter.

Series A

Under Series A below are listed the elisions, intrusions, and substitutions of all the responses of all the children to the complete series of ninety pictures, together with the random comments which these pictures stimulated. The pictures were exposed one at a time slowly so that full opportunity was given for free remarks by the child. The child might repeat the word for a given picture two or more times, with various approximations to its accepted pronunciation. In the case of a few children the pictures were shown twice, and it was found that the responses to the same picture might vary. All such responses are included in Series A.

Series B

Under Series B are listed the elisions, intrusions, and substitutions of all the responses of most of the children to the first forty-five pictures which were exposed subsequently to those for Series A. In contrast with the first series the pictures for Series B were exposed quickly, one at a time in staccato fashion, so that little opportunity was given after a response was made to comment or vary the pronunciation.

Series C

No separate repetition of the pictures was shown for this series. Series C is merely a computation of the elisions, intrusions, and substitutions of the last forty-five pictures (from number 46 to 90) in Series A. Practically, Series C is the second half of Series A although it is important to note that the random comments which the pictures stimulated on the first showing fell mainly in the first half. Some boredom was shown during the second half, and a few children were unable to complete all ninety pictures.

The following tabulations contain a description of phonemes with the consonants arranged in descending order of error frequency:

Total First Presentation Series A	First Half of Series, Second Presentation Series B	Second Half of Series, First Presentation Series C
	Elision	
l, r, t, s, d, n, m, h, k, b, ð, z, ñ, w, ʧ, ts, f, p, kl, tl	l, r, t, k, s, d, ŋ, m, ñ, h, z, ɹrz, ʧ, ð, θ, w, ts	l, t, r, d, b, n, s, kl, m, h, w, z, ð
	Intrusion	
', w, d, t, l, h, r, k, y, ð, b, m, n, s, v, z, t, ʃ, p, ñ, f, g	', k, d, r, b, ð, w, θ, p, f, m, y, h, n, l, t	', θ, b, k, y, w, l, h, t, z, f, ñ, r, d, p, v, n

Consonant	Total First Presentation Series A	First Half of Series, Second Presentation Series B	Second Half of Series, First Presentation Series C
		Substitution	
'	t, l, k, r, d, s, h, rl, g, dž, rk, p, ʃ, n, θ, f, nk, lk, tl	t, r, l, k, s, m, ñ, h, w, v, ld, d, n, ʃ, tl, z	t, l, r, k, g, p, h, s, sk, f, n, lk, rl, z
b	d, g, v, p, m, r, f, t, h	sp, pr, d, g, p, m, f, θ	g, v, h
g	s, z, t, ts, tʃ, k, sk, n	s, z, fl, l, ʃ, rz	s, k, sk, tʃ, z, t, n
t	k, d, tʃ, p, b, s, θ	k, d, θ, r, l, ð, s, f	k, d, s, p, b, tʃ
p	f, b, h, l, ñk, g, w	b, t, k, f	f, b, w
k	t, d, g, h, s, tr, pl		g, t, d, h, w
f	s, θ, p, b, v, sl, l	s, l, ʃ	θ, s, p, b, l
r	l, w, y, d, g, k	d	l, b, y
d	ð, t, g, k, l, h	ð, t, k, g, b	t, ð, g, l
w	r, l, b, v, n, d	r, l, h, m	r, l
s	θ, ʃ, z, f, t, h	ʃ, θ, z	θ, ʃ, f, t
ʃ	s, z, f, fl, m, r	s, f, tʃ	s, z
ð	t, z, θ, s, ts, l	z, d, tr	t, l
m	n, ñ, b, l, r	n, r	n, b, r
n	ñ, g, m, mp, ɹrn	ñ	ñ, m, mp
ñ	r, m, n, l, z	m, n	m, r, n
v	r, w, b, p, ð	w, z	r
t	ʃ, t, s, z	ʃ, t, s	ʃ, t, s
ts	s, tʃ, ʧ, tr	z, tr	s, tʃ
z	s, ts, d	ž	s
y	r, w, l	l, s, kt	
h	k, s, bl	r, s	k
g	k, d	k, t	k, d
l	b, r	n, ð	
dž	s, d	ʃ, tʃ	

The tabulation does not include those substitutions in which only one consonant served as the correct model for the substituted consonant.

CONSONANTS AS UNITS

Of all the changes that the child may make, the most easily treated are the substitutions and elisions of consonants. The adult vowel patterns that we note in listening to the speech of our friends exhibit considerable variability from person to

person. The consonant pattern remains relatively stable and is more essential to the understanding of English speech, whether written or spoken. A code language, "consonant English", is widely used by wireless operators. In this code all the vowels have been eliminated, but operators easily learn to read it. Furthermore, we find that physiologically consonants are produced by vocal movements which are rather sharply set off from one another. The mouth positions which produce vowel sounds, on the other hand, merge into each other by degrees with an accompanying and corresponding continuity and lack of clear boundaries between the sounds that are the result of these movements.

It is easy to see, also, that elisions and substitutions of sounds are more susceptible to numerical treatment than are the intrusions. When a consonant is elided or when it has another substituted for it, we may say that the child is a consonant short of the correct pattern. The problem of equal units, of one elision or substitution being more important than another, is no greater and no less than the problem of equal units in any testing procedure. Moreover, the practice of treating speech sound material in this way has a precedent in the scoring of the Stinchfield (7) tests of speech sounds.

There is available a standard work on American pronunciation, Harold Palmer's A Dictionary of English Pronunciation With American Variants (6). It was not thought necessary to consult this work systematically in checking standards of consonant pronunciation. Even between English and American usage, consonant forms in standard pronunciation show almost no difference. The elision of final r in England is one of the few important demonstrable variants in consonant usage. In the absence of extensive adult norms, the scoring will remain a matter of one's knowing the range of adult usage.

RELIABILITY

The use of a series of ninety pictures to elicit meaningful speech sounds has been described. Since each child's record was tabulated according to consonants elided and substituted, the reliability coefficient[1] was computed from this tabulation. The consonants and consonant combinations which were found in the adult pronunciations were listed in alphabetical order. The proportion of elisions and substitutions was found for each consonant or combination. The proportion of elisions and substitutions was also found for the sum of all the odd members of the consonant list and likewise for the even numbers for each child. These proportions were then correlated against each other. The resulting correlation was .86 which gave a reliability coefficient of .92, a reasonably high value.

PROPORTION OF CORRECT USE

In Table I page 55 and the following tabulations results are stated in terms of proportion of correct usage. The records of twenty-five children were taken to give these proportions. Table I gives the number of times the children used the consonant in a place where its adult use is indicated, and the frequency of occurrence of the consonant in adult usage of the words in question.

Ranking Proportion of Correct Use	Most Frequent Intrusive Consonants	Elisions in Upper Half of Ranking	Scatter
b	*		7
f			5
n		*	3
w	*		4
p			5
k	*		4
g			2
m			3
z			2

1. For a discussion of reliability, see Garrett's Statistical Methods for Psychology and Education (2) or any recent standard work on statistics. In computing a reliability coefficient, the consistency of a sample is obtained by finding the degree of relationship between random halves of the sample. This is done by computing a coefficient of correlation between the two halves in the trait to be measured. This procedure has become standard in all testing and measurement using human subjects in a sufficient number. Reliability is necessary, though not a final, requirement for the validity and usefulness of any test.

Ranking Proportion of Correct Use	Most Frequent Intrusive Consonants	Elisions in Upper Half of Ranking	Scatter
d		*	5
s		*	4
tʃ			3
ʃ			4
n		*	3
r		*	4
l		*	1
t			7
h			2
ts			3
ð			3

Unranked	Most Frequent Intrusive Consonants	Elisions in Upper Half of Ranking	Scatter
ʾ	*		16
θ	*		7

TABLE I

ELISION PERCENTAGE OF CONSONANTS AND CONSONANT PHONEMES

Consonants	Frequency of Use by 25 Children	Frequency If Children Had Followed Adult Usage	Proportion Correct	Rank: Consonants	Rank: Consonant Phonemes
b	465	477	.975	1	2
d	304	341	.892	10	13
f	193	200	.965	2	4
g	226	239	.945	7	10
h	174	237	.734	18	21
d͡h	34	35	.971		3
k	605	639	.947	6	9
l	512	638	.803	16	19
m	255	272	.938	8	11
n	570	595	.958	3	4
ñ	91	111	.820	14	17
p	312	328	.951	5	6
r	636	791	.804	15	18
s	463	521	.889	11	14
ʃ	76	90	.844	13	16
t	564	716	.788	17	20
ts	98	149	.658	19	22
tʃ	74	84	.881	12	23
ð	156	249	.627	20	15
θ	18	35	.514		24
v	36	38	.947		8
w	165	173	.954	4	5
y	62	63	.984		1
z	165	182	.907	9	12

The group of children from the Children's Community was shown pictures 1 to 45 (first half of the series of ninety pictures). Their responses in terms of the most frequently intrusive consonants in ranking compared with the data from the nursery school group were as follows:

Institute of Child Welfare Group	Children's Community Group
s	s w
k	r ɔ
ɔ	t θ
θ	h

This shows that three consonants, w, θ, and the glottal stop, ʾ , were conspicuously intrusive in both groups. It is interesting to note that these same three consonants are frequently intrusive in adult speech. The θ is intrusive in the speech of adults who are said to lisp, the w is characteristic of indistinct speech and generally accompanies lax formation of sounds, and the glottal stop is characteristic of very rapid and nervous adult speech.

The tabulation below shows almost perfect agreement in both groups for elision. Z and ð are elided in the Children's Community group in addition to the elisions conspicuous in both groups: n, d, s, r, l, t.

Institute of Child Welfare Group	Children's Community Group
n	n
d	d z
s	s
l	l ð
r	r
t	t

The scatter type of variation is practically the same in both groups. The tabulation preceding brings together the significant consonantal data and enables one to see at a glance all the descriptive devices which our various classifications have yielded. It may be noted here that certain common linguistic classifications, for example, progressive and regressive assimilation, have been deliberately avoided because it was thought that to classify consonants in certain ways would be to

prejudge the cause of the changes observed.[1]

PHONETIC ANALYSIS OF "DIFFICULTY"

The most striking observation to be made in regard to the relative success of the sounds used is the apparent ease with which labials are made. The labials b, f, w, and p are used most correctly and are most favored; m is relatively easy although it does not fall in the most favored group.

Consonants produced primarily by the back of the tongue or in the back of the mouth (k, g, ñ, h) do not fall together in the ranking: k and g rank 6 and 7, a fairly good rank; ñ ranks 14, not good; and h ranks 18, very low.

Consonants produced primarily by the tip of the tongue or the front of the tongue (ð, ts, t, l, r, ʃ, tʃ, s, d, n) are used least correctly as a type and are least favored. Being an apparent exception, n is used quite correctly but is distinctly a disfavored consonant (infrequently intrusive, infrequently substituted for other consonants, rather frequently elided).

A great many hypotheses as to the cause of the ease (success) in producing labial sounds may be advanced:

1. The possibility of imitation with visual aid has been suggested. This explanation of imitation of speech sounds, invoked by Preyer and others, has not received much attention in recent years. Our general knowledge of the child's utilization of rather fine visual cues would not lend much support to this theory.
2. Superior adult instruction for lip sounds is another explanation. This overlaps the following hypothesis.
3. The adult might know more about the production of front sounds whose means of production are visible in his fellow speakers.
4. Early development of lip reflexes as against tongue reflexes is a fourth hypothesis. Developmental studies of motor reactions would be of help in evaluating this one. Other analyses by the authors according to phonetic classification have yielded little of interest.

Under the circular reflex theory, continuants might be expected to show earlier use than plosives. Continuants are sounds

1. It would have been possible, indeed it still is possible, to analyze our data in different ways. For example, we could show when the intrusive, substituted, and elided consonants are initial, medial, or final. One objection to this is that the resulting analysis would have fewer units to deal with, and thus would present greater statistical difficulties. In determining the speech profile of a given child, a more refined analysis will be necessary. In an attempt to get a rough collective pattern, it was felt that certain refinements of analysis might be neglected.

Of all consonants b is oftenest used correctly: It is also very frequently introduced when not necessary. It is seldom left out of a word in which it should occur, but is incorrectly used in place of a maximum number of different consonants. In short, b is a much favored consonant, is used correctly, intrusively, and as a substitute for more difficult consonants, and is scarcely ever left out when it should be used.

In point of correct usage n ranks high. It is not frequently intrusive, but is quite frequently left out when it should be used. It is incorrectly used in place of a moderate number of different consonants. In short, n is not a very favored consonant, but is generally used correctly.

In correct usage w and k rank fairly high. They are frequently intrusive, but in contrast are not often left out when they should be used. They are incorrectly used in place of a moderate number of other consonants. In short, w and k are easy consonants, frequently hit when other consonants are intended.

Only medium correctness in use is found for d and s. These consonants are rarely intrusive, but are frequently left out when they should occur. They are incorrectly used for a considerable number of other consonants. In short, d and s are not used very correctly nor are they much favored, but they are frequently hit when other consonants are intended.

The consonants r, l, and t have in common the fact that they rank low in point of correct usage, are infrequently intrusive, but consistently occur in all series as the common consonants in being elided. They are so far from being favored consonants that one might almost say that r, l, and t are deliberately avoided.

The consonant r occurs incorrectly in place of a moderate number of different consonants, and t in place of a maximum number of other consonants. That is, r and t, while not favored consonants, are frequently hit when other consonants are attempted.

On the other hand, l is used incorrectly for a minimum number of other consonants. Of all consonants l would appear to be the least favored, the most consistently avoided. That this may not be entirely a matter of difficulty is shown by the fact that each child was able to produce both the light and dark variety of l, as well as the ʔ (the glottal stop). θ and non-English palatalized l were among the most intrusive of all consonants, and they substituted for a larger number of different consonants than any other in the record. However, the glottal stop (ʔ) was necessarily counted as incorrect (100 per cent incorrect usage), and θ fell below the first twenty consonants in proportion of correct usage.

that may be produced for any length of time. Because of this, simultaneous production and hearing would cover a longer period of time than would be the case for plosives, in which the sound is produced by a single expulsion of air. The rank of the continuants is 2, 3, 8, 9, 11, 13, 14, 15, 20. It is apparent that they cover the whole range of difficulty.

So far as voiced and unvoiced pairs of consonants are concerned (for example, b and p, d and t, z and s, and so on), there is evidence to show that the voiced consonant is easier to produce (that is, produced more successfully) than the unvoiced consonant in the pair. Thus, b ranks higher than p, d ranks higher than t, z ranks higher than s, and so on.

How far the relative success (ease) or failure (difficulty) in learning to produce different consonants is due to absolute causes (for example, physiological factors) and how much of the relative ease or difficulty is due to the phonetic configuration of the English language is a fundamental question.

SUMMARY

The present report is a phonetic study of a group of nursery school children. The advantages and limitations of such a study are to be clearly recognized at the outset. The use of a group studied under similar conditions is an advantage over individual studies in so far as it enables the study to take some account of individual differences. Any standardized procedure that may be used will take its procedure to some extent from the mental testing program. It is in the domain of mental tests that there has been worked out the most acceptable techniques for child experimentation; certainly this seems true in so far as language is concerned.

The authors hope before long to contribute some data to this fundamental question. Such additional information may be secured by showing pictures of familiar objects to children of an age and population comparable to the groups used here but speaking a different language, and then by comparing their pronunciation of the words secured with the regular adult pronunciation.

The relationship between the child's variation from adult usage and historical change in a given language or languages in general is a fascinating problem but rather too intricate and special to be treated in connection with this descriptive report.

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APPENDIX

VARIABILITY IN WORDS

The range of pronunciation for certain words is given here. The children from whose records the words are taken are designated by initials. The status of the children is as follows: H. H. is a girl, thirty-five months of age; J. E., girl, twenty-seven months; R. S., boy, forty months, not included in final record because he was bilingual, speaking both English and German in the home; B. L., boy, forty-six months. The selected words follow:

Word	Child H.H.	J.E.	R.S.	B.L.
Bird, Birdie	bɔ:id bɔ:di bɔdi	bɔ:di	bɔd bɔd berd bɔ:ərd	bɒi bi::
Chair	tse:ər tʃe:		tʃæ:r tʃə'e:r	tʃæ r tʃeə'
Dog, Doggie	dɔeg dɔgi	dɔ:gi dɔegi	dɔeg dɔg	dɔar dɔ:di dɔ:'i
Duck	dɒk dʌk		dʌk dʌk	dʌ'k dɔak dʌa'k dʌə'
Elephant	æ:'funt æ fent		ələfint	əleəfʌnt æ:əfʌn'
Fish	fiʃ fiz	piʃ piəʃ	feʃ feʃ	tʃiəhi ʃʌʃʃi
Girl	gɔ:' gɔ		gə:rl	gɔ: gɔ:ə gɔ'i gɔ:ə'
Gun	gaun gɒan			gum gɔəm gɔən gm* gn*
House	haus haus haus haus haus hau	hausθ auʃ hauʃ hauʃ ha:u: ha:uʃ	hauz haus haus haus hous ha:us ha:us ha:us	hau ha:u hau' hau' ha:uʃ
Kitty	kidi ki:di	ti:di didi kitti kitti		ki: ki:'

*Vowels not in this text

NINETY-SEVEN HUNDRED PARENTS' QUESTIONS CONCERNING CHILD DEVELOPMENT

by
Garrah M. Packer

PARENTS' QUESTIONS AS AN INDEX TO THE CONSTRUCTION OF A PARENT EDUCATION CURRICULUM

An Approach to the Problem

The rapid development of parent education during the past ten years clearly indicates that the American people are looking to this type of education for aid in solving their problems. An important problem before the parent educator is the determination of what to teach. So far, educators have given parents what they believed parents needed without determining the problems which parents meet in rearing children or without basing the curriculum on these needs. This study is an attempt to discover the needs of parents as evidenced by their questions.

Sources of the Data

The questions used in this study have been collected from child study groups in the state of Iowa. Others have been obtained from the accumulated records already on file at Iowa State College of Agriculture and Mechanic Arts, New York State College of Home Economics at Cornell University, and the Missouri Branch of the National Congress of Parents and Teachers. Many questions have been collected directly from the home and preschool.

Purpose of the Study.

The purpose of the present study is not to set up any criteria as to the type of question in which parents should be interested, or even to presume that they are bound to be interested in any particular phase of child rearing. Rather this study investigates the activities of parents in child training from the viewpoint of the training necessary for their achieving efficiency in these activities. Parents have been selected without regard to educational status, age of child, or other qualifications (except study group attendance for about one-half the sampling), although certain of these factors have been considered in the analysis of the questions.

The specific aims of this investigation are as follows:

1. To determine what parents want to know in child training
2. To determine the age and educational relevancy of various categories of knowledge
3. To discover whether there is a difference in the wants of urban and rural parents

Method of Procedure

Three sources were used in obtaining the questions: (1) a parents' information card giving the name, address, and educational background on one side and attendance at a study group, length of time, and number and ages of children on the other side; (2) a simple blank for recording the questions; and (3) a sheet for the recorder as a sample for recording the questions. Instructions for the leader and for the recorder were also prepared and either given or sent to the leader of each group, who in turn gave the recorder his instructions and blanks upon which to record the questions.

A recorder chosen by the leader of each child study group wrote down the questions as the parents asked them. The questions were classified by means of the key used in analyzing other parent education materials.

The data were treated under four definite headings: (1) child study groups, (2) home, (3) files, and (4) preschools. The

first three groups were further subdivided into urban and rural divisions. In the child study groups 1,437 parents asked 3,885 questions; 221 parents in homes asked 1,126 questions; 30 preschool parents asked 89 questions; and by proxy 1,523 parents asked 4,591 questions obtained from files. In all a total of 3,211 parents asked 9,691 questions, an average of three questions per parent.

CATEGORIES OR TYPES OF KNOWLEDGE USED IN ANALYZING PARENTS' QUESTIONS

Three outlines--knowledge categories, age ranges, and educational levels of parents--were used in the keying of parents' questions. Two main bases were used, one dependent on the educational levels of the parents asking questions and the other upon the age ranges of the children about whom the questions were asked. Questions were classified under the knowledge categories at each age level of the children and at each educational level of the parents.

Categories Used in This Investigation

The categories used in this investigation rest on four bases--biological, psychological, social, and a fourth division that may be termed theories, principles, and methods.

Biological Basis.- The following outline presents the biological categories. It is arranged according to the natural development of the child. Since the child begins his existence as an organism, the biological aspect is first considered.

- Reproduction
  - Protoplasm
  - The cell
  - Twining
  - Embryo and fetus
  - Sex
- Genetics and heredity
- Growth
- Bone and skeleton
  - Mechanics
- Metabolism
- Respiration
- Nutrition
- Digestion
- Blood and circulation
- Elimination
- Sense organs
- Nervous system
- Muscular system
  - Work and exercise
  - Fatigue
  - Heat production and clothing
  - Body posture
  - Abnormalities
- Sleep
- Disease
- Composite (endocrinology)
- Theories or general principles of biological development
- Physiology of speech
- General health
- Reactions of newborn infants not classifiable elsewhere

With few exceptions, the categories comprising this section need no further explanation other than that it is necessary to understand them for adequate physical development. The item growth includes everything which has to do with parts of the body except bone and skeleton, which may be found as a separate category. Disease includes not only everything falling under the usual connotations of the term disease but also deformities in general. When defects or deformities of certain parts of the body or functions are mentioned, the reference is placed under the specific part or function, but when not mentioned, the reference is placed under disease.

Psychological Basis.- The following is the outline for the psychological basis:

- Intellectual development
  - General intelligence
  - Sensation and perception
  - Ideation
    - Imagination
    - Abstraction
    - Association of ideas
    - Reasoning
  - Attention
- Language development
- Emotional development
- Aspects of personality development

Development of aesthetic ability
Development in reading, writing, and nature study
Mental disorders
Habit
  Definition and description
  General principles of habit formation
Learning
  Definition and kinds
  General principles of learning
Theories or general principles of psychological development
Instincts and reflexes, including impulses
  Definition and description
  General principles

Since the organism reacts as a unit, there is considerable overlapping of and interrelation between the various categories. For example, certain phases of motor development are so closely related to the development of percepts that it is difficult to determine where some items should be classified. However, it makes little difference in which of several possible classes an item is placed so long as liberal use is made of cross references. Dreams, daydreams, and reveries are all included under the caption imagination.

Aspects of personality development include all items related to personality development not conveniently classified elsewhere, as, for example, such complex behavior patterns as introversion and extroversion. When social behavior is not mentioned fairly explicitly in a discussion, the classification falls under the psychological or biological basis.

All degrees of quantitative mental deviations, as well as all types of qualitative deviations, are included under mental disorders. Items concerning mental conflicts, as well as items relating to feeblemindedness, are included in this group.

The classifications of habit and learning are to be used only if the discussion is clearly concerned with a description of the general nature or with general principles relating to habit or learning. For example, materials relating to habits of eating are classified under nutrition in the biological division and cross references are given as needed. Thumb sucking, if discussed as a nutrition problem, falls under nutrition and the appropriate conditioning section; if discussed as a problem in stimulation, it comes under sense organs and the appropriate conditioning section. Masturbation usually falls under the item sense organs and the appropriate conditioning section.

Social Basis.- The categories included in the social basis are as follows:

Descriptions of social behavior, social behavior patterns, social habits, and social attitudes
  Narrations of behavior
Social conditions or (and) conditionings of social and nonsocial behavior, behavior patterns, habits, and attitudes
Family relationships
  Conditioning social behavior patterns, etc.
  Conditioning nonsocial behavior patterns, etc.
Play and fellowship
  Conditioning social and behavior patterns, etc.
  Conditioning nonsocial behavior patterns, etc.
School relationships
  Conditioning social behavior patterns, etc.
  Conditioning nonsocial behavior patterns, etc.
Economic group relationships
  Conditioning social behavior patterns, etc.
  Conditioning nonsocial behavior patterns, etc.
Church relationships
  Conditioning social behavior patterns, etc.
  Conditioning nonsocial behavior patterns, etc.
Larger group relationships
  Conditioning social behavior patterns, etc.
  Conditioning nonsocial behavior patterns, etc.
Other group relationships
  Conditioning social behavior patterns, etc.

Conditioning nonsocial behavior patterns, etc.
Nonspecified environmental relationships
Conditioning social behavior patterns, etc.
Conditioning nonsocial behavior patterns, etc.
Nonsocial conditions of social behavior patterns, etc.
Theories or general principles of social development.

Behavior patterns, habits, and attitudes are loosely defined as tendencies toward action. For the present purpose two kinds may be distinguished arbitrarily, social and nonsocial. The social are those involving interactions of one person with other persons or with rules for the interaction of persons. The nonsocial are those not involving interactions of persons. In the discussion of these behavior patterns when the social aspect of the pattern is not mentioned explicitly, the material is classified under aspects of personality development in the psychological section. Most of these are social.

Certain behavior of children, especially that in relation to parents, playmates, and school, is often presented in questions asked by parents. Such material should be placed under the second item of the social section. If, in addition, such material contributed to an understanding and description of social behavior as such, it should be given a cross reference to the first item of the social section.

The development of certain nonsocial patterns should be included in the biological or psychological section in which it belongs, with a cross reference to family relationships if the conditioning of the nonsocial behavior was brought about through family relationships, or to the second subdivision of play and fellowship if brought about by play and fellowship. Social conditioning may be brought about through the media of newspapers, books, movies, magazines, radio, drama, music, art, or architecture as well as through the spoken word and other behavior.

When characteristics of parents, such as emotional instability, irritability, inconsistency, dishonesty, and so forth, are mentioned in connection with parents' conditioning of children's behavior, such characteristics are not given cross references to sections on behavior and personality but are considered under the item family relationships.

Under the item nonspecified environmental relationships are included social conditioning factors, largely social. Frequently an item classified here contains a clear reference to family relationships or vice versa; in such cases both classifications are used.

Whenever descriptions of fatigue, mental ability, and disease condition social behavior, they are given a cross reference to the item nonsocial conditioning of social behavior patterns. Only theories of social behavior are included under theories or general principles of social development. Theoretical discussions relating to development which fall under at least two fields are given cross references to theories of general development.

Theories, Principles, and Methods.- The following is the outline for theories, principles, and methods:

Theories or principles of general development
General methodology
Materials grouped around parents' problems and not classified elsewhere
Habits of eating
Habits of resting
Habits of elimination
Habits of dress
Habits of cleanliness
Play activities
Obedience
Use of money
Sex training
Books and reading
Arts (music, painting, drawing, and modeling)

General principles relating to tests and measurements are included under general methodology. Methods of measurement specific to one section, such as biological, are also classified under that section. In the third item of the section, with but few exceptions, all materials classified under other parts of

the outline appear here only as cross references.

Key for Age Ranges

The term infant as used in this investigation applies to the period from birth to seventeen months of age inclusive. Preschool denotes a child from eighteen months to five years, preadolescent from six to twelve years, and adolescent from thirteen to twenty-one years. Adult refers to the rest of life.

Questions were classified under the item combination of ages if the age range was not specified, if all age ranges were covered, if three or more age ranges were covered, if the word "child" or "children" was used, and if the words "school child", "child of school age", and so forth were used without designation of age range. If questions referring to both specific and nonspecific age levels were found in the same item and the latter was emphasized, the question was classified under combination of ages. If the term "first years", "baby", "early childhood", "small", or "little children" was used, the question was classified under combination of early ages.

Reliability of Classification

To determine the reliability of the classification, the investigator and two other persons, all trained in the use of the key, classified two sets of parents' questions chosen at random. The first set of twenty-five questions yielded an agreement of 92 per cent. The second set of 100 questions yielded an agreement of 91 per cent.

NEEDS OF PARENTS AS SHOWN BY AN ANALYSIS OF THE TOTAL QUESTIONS ASKED BY ALL PARENTS CLASSIFIED UNDER AGE RELEVANCY CATEGORIES

The analysis of parents' questions tabulated according to children's age and parents' educational level shows a wide variation in the type and number of questions. Among 9,691 questions asked, the range in frequency of appearance for questions concerning a single topic is from 1 to 2,449.

Categories Enumerated Most Frequently by All Parents

Figure 1 shows the categories receiving the greatest number of parents' questions. Of the categories occurring most frequently, 5,026 or 52 per cent of the total questions asked concern social aspects. The biological section was second in number of questions with 2,458 or 25 per cent of all questions asked; the psychological basis included 1,448 or 15 per cent of the questions.

Family relationships head the list with 2,449 or 25 per cent of the total questions asked, almost three times as many questions as any other one topic. Nutrition is the second most frequently recognized category. Third in frequency and very close to nutrition are nonspecified environmental relationships, numbering 873 questions or 9 per cent of the total questions asked. Emotional development is represented by 532 or 5 per cent of the questions.

Play and fellowship, even though natural phenomena in the development of the child and generally regarded as producing happiness, appear to be causes for parental concern. Five per cent of the questions (510 questions) fall in this class.

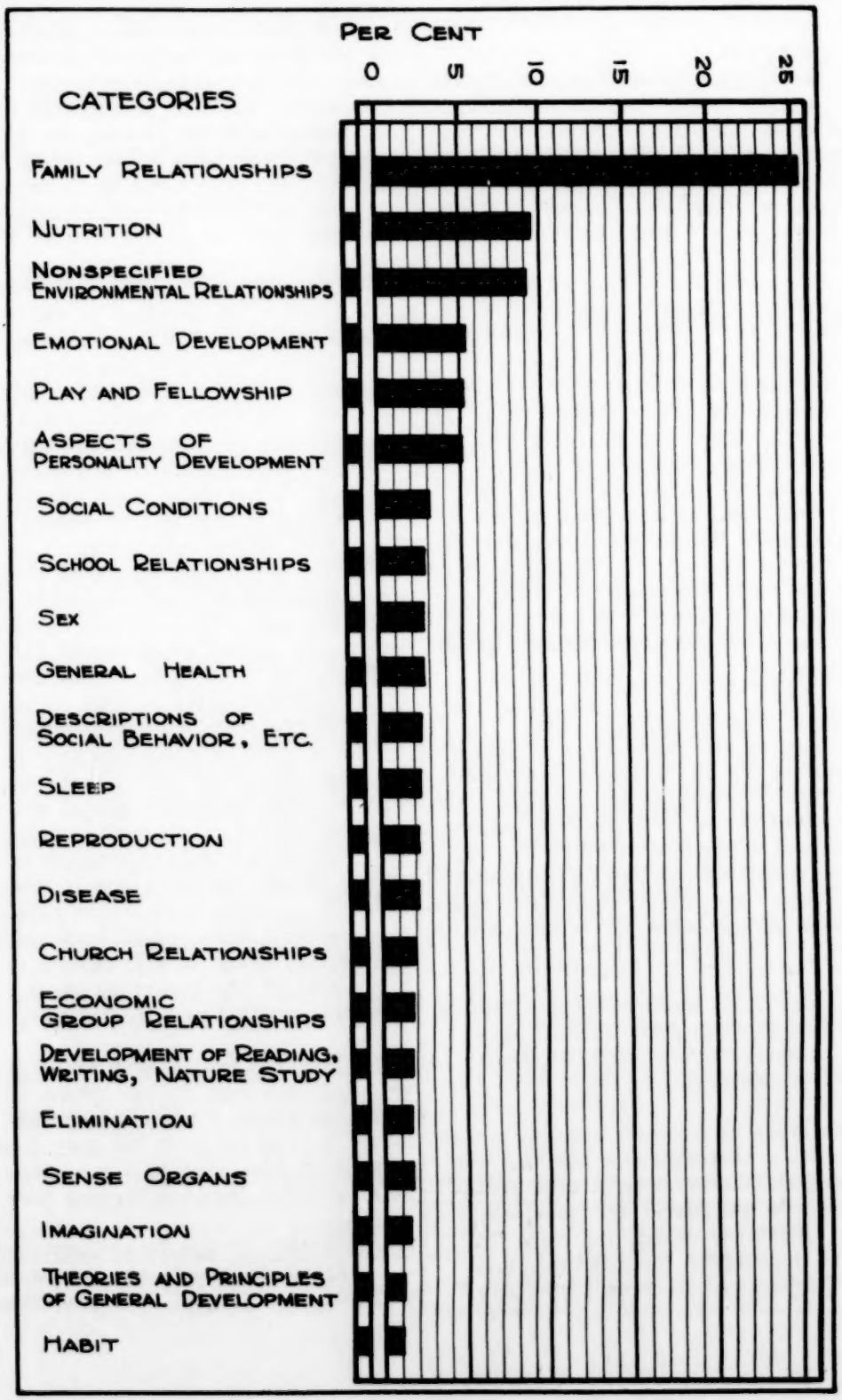
Of the total number of questions asked on the subject of school relationships, 280 or 3 per cent show that parents want to know what is going on in the school which their children attend.

In the biological categories the topic of sex is next to nutrition in frequency, with 277 or 3 per cent of the total questions asked. When sex is combined with reproduction, there is a frequency of 506 or 5 per cent of the questions asked, giving the topic sixth place in frequency of questions.

Theories and principles of general development are next to the lowest in frequency on the chart. But the fact that this topic is credited with 101 questions indicates that some parents are seeking aid in solving their problems through such means.

Age Relevancy of the Total Questions

Although parents are interested in children of all ages, more questions are


PER CENT
0
5
10
15
20
25
CATEGORIES
FAMILY RELATIONSHIPS
NUTRITION
NONSPECIFIED ENVIRONMENTAL RELATIONSHIPS
EMOTIONAL DEVELOPMENT
PLAY AND FELLOWSHIP
ASPECTS OF PERSONALITY DEVELOPMENT
SOCIAL CONDITIONS
SCHOOL RELATIONSHIPS
SEX
GENERAL HEALTH
DESCRIPTIONS OF SOCIAL BEHAVIOR, ETC.
SLEEP
REPRODUCTION
DISEASE
CHURCH RELATIONSHIPS
ECONOMIC GROUP RELATIONSHIPS
DEVELOPMENT OF READING, WRITING, NATURE STUDY
ELIMINATION
SENSE ORGANS
IMAGINATION
THEORIES AND PRINCIPLES OF GENERAL DEVELOPMENT
HABIT

asked about some ages than others. The tabulation given below shows that almost 75 per cent of the total questions asked referred to children collectively. This type of question does not reveal whether or not the parent had some specific age in mind. Of the total questions 1,533 or 16 per cent relate to children of preschool age or younger.

Age Level	Questions	Per Cent of Total Questions
Prenatal	36	.37
Infant	267	2.76
Preschool	1,008	10.40
Preadolescent	533	5.50
Adolescent	287	2.90
Adult	96	.99
Combination of ages	7,242	74.73
Combination of early ages	222	2.29
Total	9,691	100.00

Assuming that the most widespread needs of parents are shown by the frequencies of questions, what are the facts in relation to the respective age levels? Table 1 shows for each age level the categories presenting the greatest needs of parents.

Parents agree that family relationships, nutrition, and nonspecified environmental relationships are of importance for all age levels. Family relationships are of first importance at each age level except the first two. It is interesting to note that nutritional needs increase in frequency up to and inclusive of the preschool ages, but gradually decrease as the child grows older. This would indicate that nutrition presents important problems at the preschool age.

As the child advances in years, the data show that environmental conditions become more insistent. The adolescent demands the center of interest here. This indicates an adolescent social need that is inadequately met and that parents are anxious to solve.

TABLE I

AGE LEVEL AND BASE-LINE CATEGORIES OF THE QUESTIONS OF PARENTS OCCURRING WITH THE HIGHEST FREQUENCY

Categories	Age Levels								
	Prenatal	Infant	Preschool	Preadolescent	Adolescent	Adult	Combination of Ages	Combination of Early Ages	Total
Family relationships	4	38	239	139	63	43	1866	57	2449
Nutrition	7	108	159	28	4	7	568	24	905
Nonspecified environmental relationships	3	12	23	34	45	12	732	12	873
Emotional development		12	68	24	9	4	392	23	532
Play and fellowship		4	72	37	9	2	373	13	510
Aspects of personality development		7	41	38	16	5	386	6	499
Social conditions, etc.		7	3	22	6	1	258	7	304
School relationships			13	24	17	2	223	1	280
Sex			33	31	31	1	172	9	277
General health		17	12	2	5	2	233	2	273
Descriptions of social behavior		2	84	12	5	3	137	3	246
Sleep		17	77	13	6		119	4	236
Reproduction	1		11	21	7		177	12	229
Disease		10	4	7	2	1	193	5	222
Church relationships			15	11	9		149	8	192
Economic group relationships			2	10	12		147	1	172
Development in reading, writing, and nature study			12	17	4	2	126	5	166
Elimination		11	47	11			83	6	158
Sense organs		11	48	9		1	87	2	158
Imagination			7	10		1	129	4	151
Theories and principles of general development			4		2	2	92	1	101
Habit		1	1	2	4		89	3	100

Emotional development, play and fellowship, aspects of personality development, social conditions, general health, and descriptions of social behavior are recognized at all age levels except the prenatal period. The preschool child appears to be of most concern from the standpoint of these categories. School needs begin with the preschool child and are related to all subsequent ages; they reach the highest peak at preadolescence.

Sex problems appear at the preschool level and persist throughout the remaining age levels. The early age at which these problems appear is in agreement with the findings of Hattendorf.[1] The data also show that social conditions, reproduction, development in reading, writing, and nature study, and imagination reach their peak of concern during the preadolescent period.

Despite the statement so frequently heard that the religious side of the child's life is neglected, Table I shows that parents are concerned with this phase of their children's development even though, as portrayed by the questions asked, the parents themselves are undecided as to their own religious attitudes.

The data obtained by the analysis of this group of parents' questions, representing as they do many sources, show that parents' needs are wide and varied. They are physical (biological in nature), psychological, and social. Biologically the data show that parents need more fundamentals presented in a nontechnical manner, for instance, information regarding nutrition with respect to age relevancy. The data also show that parents are in need of information regarding general health, sleep, disease, elimination, and the sense organs. Emotional development, aspects of personality development, imagination, habit and development in reading, writing, and nature study constitute the greatest exigencies for aid in the psychological group. Social needs far outnumber the others. With family relationships heading the list, social needs are relevant to environment, play and fellowship, social conditions, school, church, and economics.

RELATION OF THE BASE-LINE CATEGORIES TO THE QUESTION GROUPS

It is the purpose of this section to show specifically what parents need as determined by their questions. A comparison of the four groups--study groups, parents in the home, record files of parents' questions, and parents of preschool children--showed that each group had definite problems, yet there was no agreement as to the order or degree of importance of the questions.

Basic Divisions

There is a rather striking difference in the proportion of total questions allotted to the larger basic divisions. The composite of parents' questions shows that 53 per cent of the total questions are of a social nature, 28 per cent biological, 18 per cent psychological, and only 1 per cent theories, principles, and methods.

It is significant that 67 per cent of all questions asked by parents in the home are related to social problems as compared with 55 per cent in study groups, less than half (48 per cent) in the files, and only 34 per cent of the questions of preschool parents.

Questions of a biological aspect are of importance in over half (53 per cent) of the preschool questions. From the files 34 per cent of the questions, 22 per cent of the study group questions, and 20 per cent of the home questions are concerned with needs of a biological nature.

Study groups present the larger number of psychological questions as compared with the other groups. The percentages are: study groups, 23 per cent; files, 16 per cent; home, 14 per cent; and preschool, 13 per cent. In this connection one may ask whether parents are placing the wrong emphasis on their questions and whether study group leaders are emphasizing the psychological aspect to too great a degree.

Questions of theories, principles, and methods are most conspicuous by their small percentage. In the study group the percentage was .18, in the home group .27, and zero

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for the preschool group. The largest per cent was 2.13 for the records from the files.

Table II lists the categories into which parents' questions fell and gives the percentage of the total questions found in each category for each of the four groups. Even though some of the items do not show a high percentage, the fact that questions occurred in at least three different groups on the topics covered by these categories indicates a real need on the part of the parents. The combined results of Tables I and II indicate the child development topics concerning which parents recognize a need for further knowledge as shown by the questions.

Table II shows that family relationships are considered of most importance by parents of all groups. The percentage was largest for the home, with the other three groups following in this order: files, preschool, and study groups. The home again leads in considering the importance of nonspecified environmental relationships, with study groups, files, and preschool following in the order mentioned.

Parent-Age Relevancy

The number of questions that have been asked per category does not necessarily carry the assurance that an equal number of parents have asked the questions.

TABLE II

NEEDS OF PARENTS IN PERCENTAGES BY GROUPS

Categories	Per Cent of Questions Obtained			
	Study Groups	Home	Files	Pre-School
Family relationships	18.07	37.12	28.47	24.72
Nonspecified environmental relationships	11.55	12.17	6.23	1.12
Emotional development	7.49	2.93	4.47	3.37
Aspects of personality development	7.46	4.35	3.34	7.87
Nutrition	6.51	6.93	12.09	21.35
Play and fellowship	6.20	4.09	4.75	5.62
Social conditions, etc.	5.41	4.09	1.02	1.12
School relationships	4.71	3.29	1.29	1.12
Sex	4.55	2.49	1.55	1.12
Descriptions of social behavior	3.53	.44	2.27	
Sleep	2.86	2.93	1.72	14.61
Economic group relationships	2.60	1.60	1.15	
Imagination	2.32	.98	1.09	
Elimination	2.01	1.16	1.42	2.25
Development in reading, writing, nature study	1.75	2.40	1.55	
Church relationships	1.39	2.49	2.40	
Reproduction	1.34	1.16	3.57	
General health	1.21	.89	4.68	1.12
Disease	1.00	.80	3.77	1.12
Sense organs	.80	1.90	2.14	7.87
Other group relationships	.75	.80	.22	
General intelligence	.70	.18	.04	
Genetics and heredity	.64	.53	.37	
Development of aesthetic ability	.62	.62	.63	
Growth	.54	.18	.28	1.12
Habit	.54	.36	1.63	
Motor development	.39	.18	.50	
Work and exercise	.28	1.07	.59	
Theories or general principles of social development	.28	.18	.50	
Reasoning	.23	.18	.09	
Language development	.15	.36	.81	2.25
Larger group relationships	.13	.26	.04	
General methodology	.10	.28	.02	
Theories or principles of general development	.08	.09	2.11	
Bone and skeleton	.03	.09	.02	
Body posture	.03	.09	.13	

A fair estimate has been made for study groups, the home, and the preschool. (There were no data available for the file group.) This total shows that for these groups there were 1,688 parents who asked 5,100 questions or an average of three questions per parent. Using this as a basis for estimating the number of parents asking the questions in the files, we find there were 1,523 parents. This gives a final total of 3,211 parents asking the 9,691 questions used in this investigation.

Table III gives the number of parents asking questions, the percentage of total parents, the educational levels represented by the parents, and the number of questions asked at each age level of the child for the study group, home, and preschool parents individually and combined.

Questions from large numbers of parents are so stated that they must be placed in the classification, combination of ages. An important finding is the fact that more parents ask questions concerning the preadolescent age than any other specific age of the child. Of the remaining ages parents ask questions in descending frequency about the adolescent, infant, combination of early ages, adult, and prenatal age.

In the study groups parents of all educational levels asked questions about all age levels except the prenatal age. At this level only parents having finished eighth grade, those having finished one to three years of college, and those who did not indicate educational level asked questions. All parents of the home gave their educational levels, whereas many of the parents of the study groups omitted this information. Parents at all educational levels asked questions about the preschool age, the preadolescent age, combination of ages, and combination of early ages. The section of Table III dealing with preschool parents is to be noted particularly in that all parents of this group asked all their questions concerning one age, the preschool age. This is surprising even for parents of preschool children.

TABLE III

NUMBER OF QUESTIONS ASKED ABOUT EACH AGE LEVEL OF DEVELOPMENT, NUMBER OF DIFFERENT PARENTS' QUESTIONING, AND PER CENT OF TOTAL PARENTS' QUESTIONING

Age Levels Included in Questions	Questions	Different Parents' Questioning	Per Cent Questioning
Home			
Prenatal	1	1	.45
Infant	17	8	3.62
Preschool	125	59	26.70
Preadolescent	242	80	36.20
Adolescent	55	23	10.41
Adult	2	2	.90
Combination of ages	658	45	20.36
Combination of early ages	26	3	1.36
Total	1126	221	100.00
Preschool			
Preschool	89	30	100.00
Total	89	30	100.00
Study Groups			
Prenatal	4	3	.21
Infant	63	42	2.92
Preschool	201	145	10.09
Preadolescent	206	148	10.30
Adolescent	131	75	5.22
Adult	49	35	2.44
Combination of ages	3141	932	64.86
Combination of early ages	90	57	3.96
Total	3885	1437	100.00
Combined Groups			
Prenatal	5	4	.24
Infant	80	50	2.96
Preschool	415	234	13.86
Preadolescent	448	228	13.51
Adolescent	186	98	5.81
Adult	51	37	2.19
Combination of ages	3799	977	57.88
Combination of early ages	116	60	3.55
Total	5100	1688	100.00

Educational Status of Parents

Does any relationship exist between the questions the parent asks and the amount of education he had had? Table IV gives a clearer understanding of the educational status of all parents asking questions in all groups, combined and individually.

Educational-Age Relevancy of Parents' Questions.- In an analysis of the total group

TABLE IV

EDUCATIONAL LEVEL OF PARENTS, NUMBER OF DIFFERENT PARENTS' QUESTIONING, PER CENT OF TOTAL PARENTS' QUESTIONING, AND NUMBER OF QUESTIONS ASKED ABOUT EACH AGE LEVEL OF DEVELOPMENT

Educational Level of Parents	Different Parents' Questioning	Per Cent Questioning	Questions
Home			
Less than eighth grade	22	9.96	98
Finished eighth grade	25	11.31	77
One to three years high school	23	10.41	73
Finished high school	50	22.62	207
One to three years college	45	20.36	251
College graduate	56	25.34	420
Total	221	100.00	1126
Preschool			
Less than eighth grade	1	3.33	6
Finished eighth grade	1	3.33	1
Finished high school	10	33.34	34
One to three years college	6	20.00	13
College graduate	12	40.00	35
Total	30	100.00	89
Study Groups			
Less than eighth grade	119	8.28	283
Finished eighth grade	88	6.12	230
One to three years high school	195	13.57	500
Finished high school	350	24.36	810
One to three years college	275	19.14	825
College graduate	160	11.13	623
Not answering	250	17.40	614
Total	1437	100.00	3885

Table IV (Continued)

Combined Groups			
Less than eighth grade	142	8.41	387
Finished eighth grade	114	6.75	308
One to three years high school	218	12.92	573
Finished high school	410	24.29	1047
One to three years college	326	19.31	1089
College graduate	228	13.51	1078
Not answering	250	14.81	614
Total	1688	100.00	5100

only those parents having finished the eighth grade, those who entered college, and those who failed to give their educational status asked questions about all age levels. Parents of all other educational levels were not concerned about the prenatal period. It is of interest to note that, although parents having one to three years of college education ask more questions than any other one educational level and are concerned about all age levels, there are more different parents asking questions whose education terminated at high school graduation. College graduates ask more questions per parent about all ages than any other one educational level.

The educational level of the different parents asking questions in all study groups is shown in Table IV. Only three groups of parents, those completing an eighth grade education, those graduating from college, and those who did not indicate their educational level, asked questions about all ages of children. The rest of the age levels are concerned with all but the prenatal age. There is a gradual increase in the number of questions asked per parent as the educational status increases.

Parents of less than eighth grade education in the home ask more questions per

parent than parents of the corresponding educational level in the preceding groups; they are not concerned with either the prenatal or adult age levels. The succeeding educational levels of this group show a gradual increase in the number of questions asked per parent. Parents of less than eighth grade and high school graduation in the preschool groups ask more questions per parent, but there are more different parents asking questions at the level of the college graduate.

Problems of Parents.- An attempt will be made to show what the problems of parents of the varying educational levels are by an analysis of their questions. Only those categories of 1 per cent or above will be discussed here. The complete list of categories shows that many are of low percentage. This leads directly to the question, "Can few frequencies present any facts of significance?" Still some need is shown if parents ask even one question.

Five categories--family relationships, non-specified environmental relationships, nutrition, aspects of personality development, and emotional development--comprise 54 per cent of the total questions asked by parents of all educational levels.

Table V gives the percentage of total questions received by the categories having the most questions according to the educational level of the parents. In over half of the items there is a constant uniformity among the educational levels in the categories. In the remainder there is little uniformity. No two educational levels agree upon exactly the same items, and there is small difference in the total number of items per educational level. As educational levels advance, new categories are added.

TABLE V

EDUCATIONAL LEVEL OF PARENTS FOR THE BASE-LINE CATEGORIES HAVING THE HIGHEST PER CENT OF QUESTIONS

Categories	Educational Level						
	Less Than Eighth Grade	Eighth Grade	One to Three Years High School	High School Graduate	One to Three Years College	College Graduate	Not Answering
Family relationships	23.26	23.70	24.10	21.87	22.43	26.56	13.15
Nonspecified environmental relationships	9.30	14.29	11.10	11.84	10.66	12.54	11.04
Aspects of personality development	9.04	8.44	5.37	4.48	8.18	5.94	8.77
Nutrition	6.72	9.09	6.76	7.83	6.90	6.59	4.71
Sex	5.68	4.55	4.33	4.39	3.68	3.62	3.25
Emotional development	5.68	5.84	8.50	6.69	6.80	4.74	6.98
Social conditions	5.68	6.82	4.33	5.54	4.96	3.34	6.66
Sleep	4.39	1.30	3.12	3.43	2.21	4.09	2.27
Play and fellowship	4.13	3.90	6.24	6.69	4.96	6.32	5.84
General health	3.87					1.21	1.94
School relationships	2.84	3.90	3.99	4.79	4.96	3.44	5.36
Imagination	2.32	2.27	2.43	1.62	1.66	1.39	3.41
Descriptions of social behavior, etc.	1.81	1.95	2.95	2.38	2.94	2.60	4.38
Economic group relationships	1.81	1.30	3.47	2.96	1.56	1.49	3.90
Elimination	1.55		1.39	2.10	2.02	2.41	
Development in reading, writing, nature study	1.55	2.2.	2.25	1.52	1.56	2.41	1.62
Reproduction	1.29	1.62	1.56	1.14	1.20		2.76
Church relationships	1.29	1.95		1.62	2.39	1.30	1.62
Sense organs	1.03				1.47	1.86	
Other group relationships		1.30	1.04				
Genetics and heredity			1.04				1.36
Disease				1.81	1.01		1.29
Habit							1.46
Development of esthetic ability							1.36

RELATION OF THE BASE-LINE CATEGORIES TO THE URBAN AND RURAL QUESTION GROUPS

Urban and Rural Parent-Age Relevancy

A further study of the parents asking questions is based on the division of parents into those from urban and those from rural districts. The criterion for this division is that used by the committee on social and religious surveys.[1] All populations of 5,000 or more are termed urban; all under that number may be considered rural.

For this part of the investigation the study groups, the home, and the preschool parents were each subdivided into urban and rural parents. Then the urban parents from the three different groups were combined. An analysis of the resulting data is given in Table VI. The same combination was made for the rural parents, and the results are given in Table VII.

Table VI shows that for the urban groups 1,434 parents asked 4,314 questions, an average of three questions per parent. The total number who were interested in ages below the preschool level was 100 or 7 per cent of the parents. Parents of all educational levels asked questions about all age levels except the prenatal age.

The total number of urban study group parents who were interested in age levels below the preschool age was eighty-nine or 7 per cent of the parents. Parents of all educational levels asked questions about all age levels except the prenatal age; only parents having finished eighth grade and those who failed to indicate educational level asked questions concerning this age. Nine or 4 per cent of the urban home parents were interested in ages below the preschool. It is significant to note that all parents of the home group gave their educational levels as contrasted with the many omissions on the part of parents of the study groups. All thirty parents of the urban preschool group asked all their questions concerning one age, the preschool age. These parents, who represent all educational levels except one to three years of high school, asked eighty-nine questions concerning the preschool child.

TABLE VI

NUMBER OF QUESTIONS ASKED ABOUT EACH AGE LEVEL OF DEVELOPMENT, NUMBER OF DIFFERENT URBAN PARENTS' QUESTIONING, AND PER CENT OF URBAN PARENTS' QUESTIONING

Age Levels Included in Questions	Questions	Different Parents' Questioning	Per Cent Questioning
Urban Home			
Prenatal	1	1	.49
Infant	17	8	3.90
Preschool	121	57	27.81
Preadolescent	231	74	36.10
Adolescent	47	21	10.25
Adult	2	2	.97
Combination of ages	555	40	19.51
Combination of early ages	24	2	.97
Total	998	205	100.00
Urban Preschool			
Preschool	89	30	100.00
Total	89	30	100.00
Urban Study Groups			
Prenatal	3	2	.17
Infant	50	34	2.84
Preschool	173	126	10.51
Preadolescent	173	130	10.84
Adolescent	99	56	4.67
Adult	43	31	2.59
Combination of ages	2612	767	63.96
Combination of early ages	74	53	4.42
Total	3227	1199	100.00
Combined Groups			
Prenatal	4	3	.21
Infant	67	42	2.93
Preschool	383	213	14.85
Preadolescent	404	204	14.23
Adolescent	146	77	5.37
Adult	45	33	2.30
Combination of ages	3167	807	56.28
Combination of early ages	98	55	3.83
Total	4314	1434	100.00

An analysis of data concerning the rural parents in each of the three groups individually and combined is given in Table VII. Fourteen or 6 per cent of the parents (combined groups) asked questions concerning the

1. Morse, Herman Nelson, and Brunner, Edmund de Schweinitz: The Town and Country Church in the United States: As illustrated by Data From One Hundred Seventy-Nine Counties and by Intensive Studies of Twenty-Five. New York: Doran, 1923, pp. xiii, 179.

TABLE VII

NUMBER OF QUESTIONS ASKED ABOUT EACH AGE LEVEL OF DEVELOPMENT, NUMBER OF DIFFERENT RURAL PARENTS' QUESTIONING, AND PER CENT OF RURAL PARENTS' QUESTIONING

Age Levels Included In Questions	Questions	Different Parents' Questioning	Per Cent Questioning
Rural Home			
Preschool	4	2	12.50
Preadolescent	11	6	37.50
Adolescent	8	2	12.50
Combination of ages	103	5	31.25
Combination of early ages	2	1	6.25
Total	128	16	100.00
Rural Study Groups			
Prenatal	1	1	.42
Infant	13	8	3.36
Preschool	28	19	7.99
Preadolescent	33	18	7.56
Adolescent	32	19	7.98
Adult	6	4	1.68
Combination of ages	529	165	69.33
Combination of early ages	16	4	1.68
Total	658	238	100.00
Combined Groups			
Prenatal	1	1	.39
Infant	13	8	3.15
Preschool	32	21	8.27
Preadolescent	44	24	9.45
Adolescent	40	21	8.27
Adult	6	4	1.58
Combination of ages	632	170	66.93
Combination of early ages	18	5	1.96
Total	786	254	100.00

child below the preschool age. Thirteen or 5 per cent in the rural study groups were interested in ages below the preschool age. No data are given for the preschool parents because all of the parents in this group were classified as urban.

Comparison of Rural With Urban Group.- The ratios between the number of urban and rural parents asking questions per age level differ widely. While both types of parents are interested in all age levels, the data show that rural parents ask for more aid in the prenatal, infant, adolescent, and combination of ages than do the urban parents. Although the number of the rural parents asking questions about the adolescent far exceeds that of the urban parents, there are more urban parents asking questions about the preadolescent age.

The excessive percentage of both urban and rural parents who state their questions so generally as to fall under combination of ages indicates that (1) parents do not know that different ages of childhood need different treatment, (2) they do not know how to state their questions, or (3) they sense that something should be adjusted but cannot diagnose their cases sufficiently to reveal the need.

On the whole, parents of both groups are asking questions about all ages with the emphasis salient in the adolescent ages. Figure 2 gives the ratio of urban and rural parents asking questions per age level.

Urban Question Group

Basic Divisions.- There is a rather striking difference as to the proportion of total questions of the urban question group allotted to the larger basic divisions. The composite of parents' questions shows that 52 per cent of the total questions are of a social nature, 28 per cent biological, 19 per cent psychological, and .11 per cent theories, principles, or methods.

It is significant that 66 per cent of all questions asked by the home are related to social problems as compared with 55 per cent by study groups, 46 per cent by files, and 40 per cent by the preschool parents. Questions concerning the biological aspect are of importance in over half the preschool questions, 36 per cent of the files, 22 per cent of study group questions, and 22 per cent of the home questions.

Important Categories.- From Table VIII we are able to determine what types of questions parents agree upon. All parent groups ask questions about:

Family relationships
Non-specified environmental relationships
Emotional development
Aspects of personality development
Nutrition

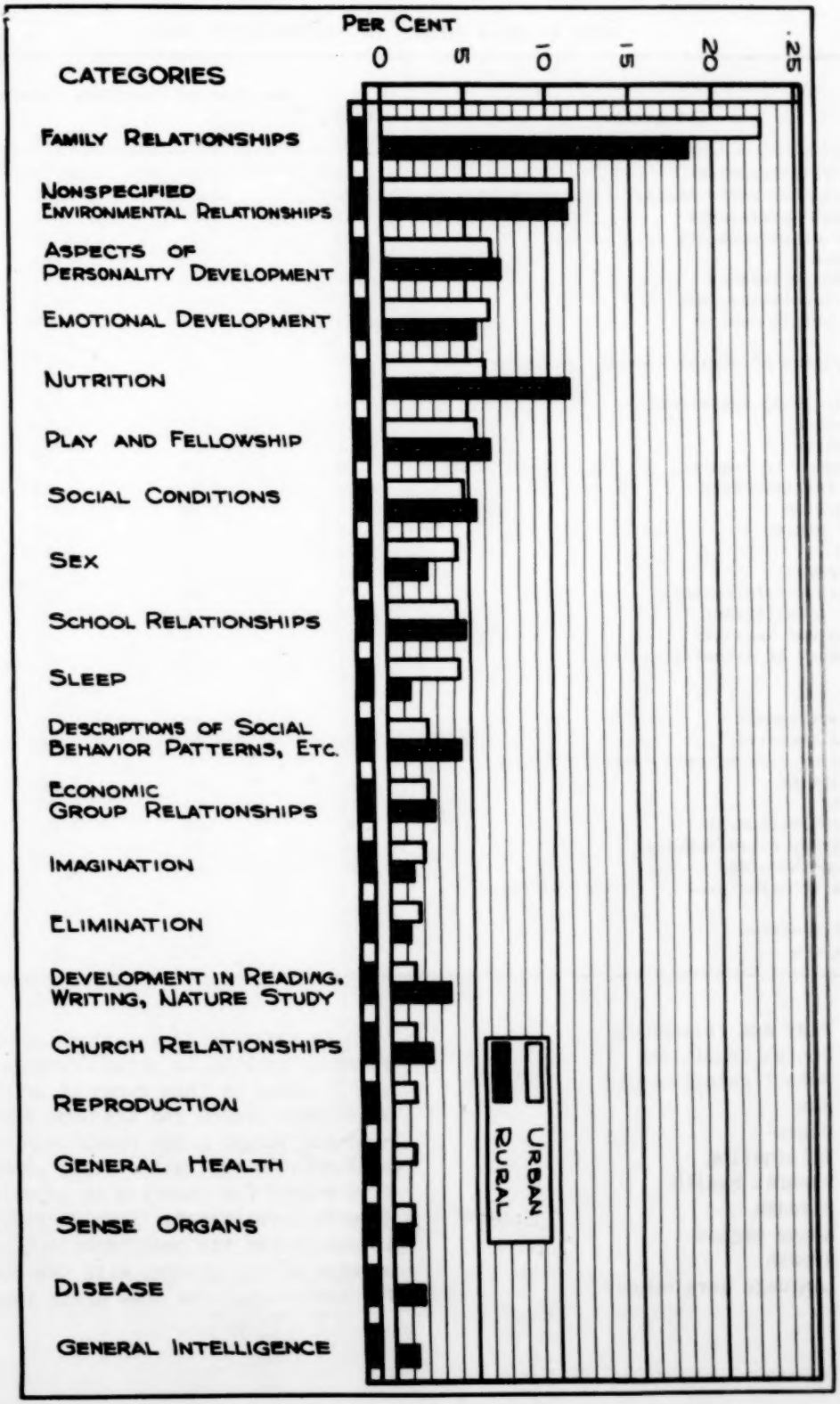
PER CENT
0
5
10
15
20
25
CATEGORIES
FAMILY RELATIONSHIPS
NONSPECIFIED ENVIRONMENTAL RELATIONSHIPS
ASPECTS OF PERSONALITY DEVELOPMENT
EMOTIONAL DEVELOPMENT
NUTRITION
PLAY AND FELLOWSHIP
SOCIAL CONDITIONS
SEX
SCHOOL RELATIONSHIPS
SLEEP
DESCRIPTIONS OF SOCIAL BEHAVIOR PATTERNS, ETC.
ECONOMIC GROUP RELATIONSHIPS
IMAGINATION
ELIMINATION
DEVELOPMENT IN READING, WRITING, NATURE STUDY
CHURCH RELATIONSHIPS
REPRODUCTION
GENERAL HEALTH
SENSE ORGANS
DISEASE
GENERAL INTELLIGENCE
URBAN
RURAL

TABLE VIII

NEEDS OF URBAN PARENTS IN PERCENTAGES BY GROUP

Categories	Per Cent of Questions Obtained			
	Study Groups	Home	Files	Pre-School
Family relationships	18.56	37.58	26.68	24.72
Non-specified environmental relationships	11.74	11.93	6.26	1.12
Emotional development	7.62	3.31	5.86	3.37
Aspects of personality development	7.56	3.91	3.31	7.87
Nutrition	5.36	7.01	12.63	21.35
Play and fellowship	6.07	4.21	5.46	5.62
Social conditions, etc.	5.30	4.21	1.14	1.12
School relationships	4.89	2.31	.89	1.12
Sex	4.87	2.81	1.10	1.12
Descriptions of social behavior patterns, etc.	3.19	.50	3.07	
Sleep	3.19	3.01	2.02	14.61
Economic group relationships	2.67	1.30	.21	
Imagination	2.45	1.10	1.50	
Elimination	2.14	1.30	1.63	2.25
Development in reading, writing, nature study	1.49	1.90	2.15	
Church relationships	1.12	2.71	1.81	
Reproduction	1.52	1.30	4.69	
General health	1.43	.70	4.35	1.12
Disease	.74	.90	4.42	1.12
Sense organs	.68	2.20	2.73	7.87
Other group relationships	.87	.80	.28	
General intelligence	.56	.10	.03	
Genetics and heredity	.68	.50	.31	
Development of esthetic ability	.68	.50	.80	
Growth	.59	.20	.25	1.12
Habit	.65	.40	2.11	
Motor development	.34	.10	.71	
Work and exercise	.31	1.20	.64	
Theories or general principles of social development	.34	.20	.40	
Reasoning	.25	.20	.03	
Language development	.06	.40	1.04	2.25
Larger group relationships	.16	.30		
General methodology	.09	.20		
Theories or principles of general development	.09			
Bone and skeleton	.03	.10	.03	
Body posture	.03	.10	.18	

Play and fellowship
Social conditions
School relationships
Sex
Sleep
Elimination
General health
Disease
Sense organs
Growth
Language development

In addition to questions asked by all parents, it will be noted (compare with Table II) that of this group or urban parents only study groups and the home express a need for larger group relationships and general methodology, while study groups alone find a need for theories or principles of general development. Family relationships is considered the most important category by parents of all groups, with the home leading in percentage. The home again leads in first

consideration of nonspecified environmental relationships.

Rural Question Group

Basic Divisions.- In the rural groups the composite of parents' questions shows that 55 per cent of the total questions are of a social nature, 26 per cent of a biological nature, 15 per cent of a psychological nature, and only 5 per cent pertaining to theories, principles, or methods.

It is significant that 71 per cent of all the questions asked by the rural home are related to social problems as compared with 54 per cent by files and 53 per cent by study groups. Questions concerning the biological aspect make up 28 per cent of the questions of the files, 23 per cent of the study group questions, and 12 per cent of the home questions.

Study groups again present the largest number of psychological needs as compared with the other groups. Again one wonders whether parents are at fault in the questions they ask or whether the leaders are responsible for this emphasis. Do parents need more psychological training? Questions of theories, principles, and methods are most conspicuous by their absence. The home group asks no questions of this type.

Important Categories.- Table IX shows the types of questions upon which rural

TABLE IX

NEEDS OF RURAL PARENTS IN PERCENTAGES BY GROUP

Categories	Per Cent of Questions Obtained		
	Study Groups	Home	Files
Family relationships	15.65	33.60	32.86
Non-specified environmental relationships	10.64	14.06	6.16
Emotional development	6.84		1.05
Aspects of personality development	6.99	7.81	3.38
Nutrition	12.16	6.25	10.75
Play and fellowship	6.84	3.13	3.00
Social conditions, etc.	5.93	3.13	.75
School relationships	3.80	10.94	2.25
Sex	3.04		2.63
Descriptions of social behavior, etc.	5.17		.30
Sleep	1.22	2.34	.97
Economic group relationships	2.28	3.91	3.46
Imagination	1.67		.08
Elimination	1.37		.90
Development in reading, writing, nature study	3.04	6.25	.08
Church relationships	2.74	.78	3.83
Reproduction	.46		.83
General health	.15	2.34	5.48
Disease	2.28		2.18
Sense organs	1.37		.68
Other group relationships	.15	.78	.08
General intelligence	1.37	.78	.08
Genetics and heredity	.46	.78	.53
Development of esthetic ability	.30	1.56	.23
Growth	.30		.38
Habit			.45
Motor development	.61	.78	
Work and exercise	.15		.45
Theories or general principles of social development			.75
Reasoning	.15		.23
Language development	.61		.23
Larger group relationships			.15
General methodology	.15		.08
Theories or principles of general development		.78	7.29

parents agree. This table shows that all rural parent groups ask questions about:

Family relationships
Non-specified environmental relationships
Aspects in personality development
Nutrition
Play and fellowship
Social conditions
School relationships
Sleep
Economic group relationships
Development in reading, writing, and nature study
Church relationships
General health
Other group relationships
General intelligence
Genetics and heredity
Development of esthetic ability

Age Relevancy of Most Frequent Base-Line Categories

Table X shows the number of questions per category at each age level for urban and rural groups. Non-specified environmental relationships and nutrition are of importance for all urban age levels. Barring the preschool age, family relationships, emotional development, aspects of personality development, play and fellowship, social conditions, descriptions of social behavior, general health, and disease are relevant to all ages. Family relationships, emotional development, aspects of personality development, nutrition, play and fellowship, social conditions, descriptions of social behavior patterns, sleep, elimination, sense organs, motor development, and language development all reach the highest peak in the preschool age.

Non-specified environmental relationships, social conditions, school relationships, economic group relationships, imagination, reproduction, development of esthetic ability, work and exercise, and development in reading, writing, and nature study reach the highest peaks in the preadolescent age and gradually decrease as the age of the child increases. Nonspecified environmental relationships reach their highest peak at the age of adolescence, whereas the topic of sex is equally important at the adolescent and preschool ages.

The data for the rural age relevancy show that family relationships are of steadily increasing importance with the increase of age. This is the only topic which rural parents considered important at every age level. Aspects of personality development are of high importance in the preschool age, but nutrition reaches its peak of importance during the age of infancy.

School relationships, sex, elimination, and development of reading, writing, and nature study are all of greatest concern with regard to the age of preadolescence. Rural parents are most concerned about play and fellowship for the preschool and adolescent ages.

Emotional development appears prominently for the preadolescent and the adolescent ages. Economic and church relationships appear of greatest importance at adolescence. Rural parents become most concerned as to general intellectual growth and habit at the age of adolescence. Motor development demands more attention during the infant and preschool ages.

Educational Status of All Urban Parents

The educational status of the different parents (for which educational level is known) asking questions in all urban groups individually and combined is shown in Table XI. Less than 16 per cent of the parents received an eighth grade education or less. Less than 23 per cent of the urban home parents received an eighth grade education or less. In the urban preschool group the parents receiving an elementary education of eighth grade or less numbered two or 7 per cent.

Urban groups show a general upward trend in the educational status of parents asking questions up to and including the high school graduate.

Educational Level of All Rural Parents

Table XII presents the educational level of the different parents asking questions in all rural groups. The two groups receiving an elementary education of eighth grade or less numbered thirty-one or 12 per cent of the group studied. Most of the questions of rural parents are concerned with four age

TABLE X

AGE LEVEL AND BASE-LINE CATEGORIES OF THE QUESTIONS OF URBAN AND RURAL PARENTS OCCURRING WITH THE HIGHEST FREQUENCY

Categories	Age Levels								
	Pre-natal	In-fant	Pre-school	Preado-lescent	Ado-lescent	Adult	Combi-nation of Ages	Combi-nation of Early Ages	Total
Urban Parents									
Family relationships		33	231	131	47	20	1355	49	1866
Non-specified environmental relationships	2	12	22	31	36	11	578	11	703
Emotional development		11	68	20	5	3	344	22	473
Aspects of personality development		6	41	35	12	5	294	5	398
Nutrition	7	89	145	25	2	4	391	11	674
Play and fellowship		4	67	37	5	2	295	11	421
Social conditions, etc.		7	3	20	3	1	211	6	251
School relationships			13	15	13	2	167	1	211
Sex			28	25	28	1	131	9	222
Description of social behavior		1	84	11	4	2	104	2	208
Sleep		16	73	13	5		102	3	212
Economic group relationships			2	9	8		86	1	106
Imagination			6	10		1	118	4	139
Elimination		11	46	7			68	5	137
Development in reading, writing, nature study			12	14	4	2	101	4	137
Church relationships			11	11	4		88	8	122
Reproduction	1		11	21	5		165	12	215
General health		13	10	2	2	2	166	1	196
Disease		8	4	6	2	1	152	5	178
Sense organs		11	46	8			73	2	140
Other group relationships				6	10		28	1	45
General intelligence				1			19		20
Genetics and heredity							37		37
Development of esthetic ability			3	4	1		43	2	53
Growth		3	1	3	3		20		30
Habit		1	1	2	3		84	3	94
Motor development		3	7	1			21	3	35
Work and exercise			3	5	2		32	1	43
Theories or general principles of social development							26		26
Reasoning			1	1			9		11
Language development			5	2			32	3	42
Larger group relationships				2	1		5		8
General methodology				1			3	1	5
Theories or principles of general development							2	1	3
Bone and skeleton				2			1		3
Body posture			1				7		8
Rural Parents									
Family relationships	4	5	7	9	16	23	511	8	583
Non-specified environmental relationships	1		2	2	9	1	154	1	170
Emotional development		1		4	4	1	48	1	229
Aspects of personality development		1	14	3	4		92	1	115
Nutrition		19		3	2	3	177	13	217
Play and fellowship			5		4		78	2	89
Social conditions, etc.				2	3		47	1	53
School relationships				9	4		56		69
Sex			5	6	3		41		55

Table X (Continued)

Categories	Age Levels								
	Pre-natal	In-fant	Pre-school	Preado-lescent	Ado-lescent	Adult	Combi-nation of Ages	Combi-nation of Early Ages	Total
Rural Parents									
Description of social behavior, etc.		1		1	1	1	33	1	38
Sleep		1	4		1		17	1	24
Economic group relationships				1	4		61		66
Imagination			1				11		12
Elimination			1	4			15	1	21
Development in reading, writing, nature study				3			25	1	29
Church relationships			4		5		61		70
Reproduction					2		12		14
General health		4	2		3		67	1	77
Disease		2		1			41		44
Sense organs			2	1		1	14		18
Other group relationships							3		3
General intelligence					3	1	7		11
Genetics and heredity							11		11
Development of esthetic ability			1	1	1		4		7
Growth					2		5		7
Habit					1		5		6
Motor development		2	1				2		5
Work and exercise							7		7
Theories or general principles of social development							10		10
Reasoning					1		3		4
Language development				1	1		4	1	7
Larger group relationships					1		1		2
General methodology							2		2
Theories or principles of general development			4		2	2	90		98

groups--preschool, preadolescent, adolescent, and combinations of ages. Less than 13 per cent of the rural study groups received an eighth grade education or less. Less than 7 per cent of the rural home parents received an eighth grade education or less.

Educational Relevancy of Base-Line Categories of Highest Frequency for Urban and Rural Groups

Comparisons can be made between urban and rural groups concerning the type, number, and percentage of questions asked by parents. A study of the categories showing the highest percentages about which these groups asked questions reveals that the emphasis is again given to family relationships, with the greatest percentage of needs revealed by urban educational levels. In non-specified environmental relationships, emotional development, elimination, imagination, sex, and sleep, the emphasis in the urban groups somewhat exceeds the rural groups. In nutrition the rural needs far exceed those of the urban.

In the following categories the rural percentages somewhat exceed the urban:

Aspects of personality development
Play and fellowship
Social conditions
School relationships
Descriptions of social behavior patterns
Development in reading, writing, and nature study
Church relationships

The proportion of total percentages in the

TABLE XI

EDUCATIONAL LEVEL OF PARENTS, NUMBER OF DIFFERENT URBAN PARENTS' QUESTIONING, PER CENT OF TOTAL URBAN PARENTS' QUESTIONING, AND NUMBER OF QUESTIONS ASKED ABOUT EACH AGE LEVEL OF DEVELOPMENT

Educational Level of Parents	Different Parents' Questioning	Per Cent Questioning	Questions
Urban Home			
Less than eighth grade	21	10.24	94
Finished eighth grade	25	12.20	77
One to three years high school	21	10.24	64
Finished high school	43	20.98	152
One to three years college	41	20.00	216
College graduate	54	26.34	395
Total	205	100.00	998
Urban Preschool			
Less than eighth grade	1	3.33	6
Finished eighth grade	1	3.33	1
Finished high school	10	33.34	34
One to three years college	6	20.00	13
College graduate	12	40.00	35
Total	30	100.00	89
Urban Study Groups			
Less than eighth grade	105	8.76	256
Finished eighth grade	72	6.01	191
One to three years high school	171	14.26	458
Finished high school	291	24.27	671
One to three years college	212	17.68	609
College graduate	129	10.76	473
Not answering	219	18.27	569
Total	1199	100.00	3227
Combined Groups			
Less than eighth grade	127	8.86	356
Finished eighth grade	98	6.83	269
One to three years high school	192	13.39	526
Finished high school	344	23.99	853
One to three years college	259	18.06	838
College graduate	195	13.60	903
Not answering	219	15.27	569
Total	1434	100.00	4314

TABLE XII

EDUCATIONAL LEVEL OF PARENTS, NUMBER OF DIFFERENT RURAL PARENTS' QUESTIONING, PER CENT OF TOTAL RURAL PARENTS' QUESTIONING, AND NUMBER OF QUESTIONS ASKED ABOUT EACH AGE LEVEL OF DEVELOPMENT

Educational Level of Parents	Different Parents' Questioning	Per Cent Questioning	Questions
Rural Home			
Less than eighth grade	1	6.25	4
One to three years high school	2	12.50	9
Finished high school	7	43.75	55
One to three years college	4	25.00	35
College graduate	2	12.50	25
Total	16	100.00	128
Rural Study Groups			
Less than eighth grade	14	5.88	27
Finished eighth grade	16	6.72	39
One to three years high school	24	10.08	42
Finished high school	59	24.79	139
One to three years college	63	26.47	216
College graduate	31	13.03	150
Not answering	31	13.03	45
Total	238	100.00	658
Combined Groups			
Less than eighth grade	15	5.91	31
Finished eighth grade	16	6.30	39
One to three years high school	26	10.24	51
Finished high school	66	25.98	194
One to three years college	67	26.38	251
College graduate	33	12.99	175
Not answering	31	12.20	45
Total	254	100.00	786

economic group relationships and sense organs is almost equal for the two groups, but in a more detailed analysis noticeable differences appear in the educational levels.

The educational relevancy of the baseline categories of the urban and rural groups is shown in Table XIII. Only those categories are given in which the percentages were 1 or more.

TABLE XIII

EDUCATIONAL LEVEL AND BASE-LINE CATEGORIES OF THE QUESTIONS OF URBAN AND RURAL PARENTS' OCCURRING WITH THE HIGHEST PERCENTAGE

Categories	Educational Level						
	Less than eighth grade	Eighth grade	1 to 3 years high school	High school graduate	1 to 3 years college	College graduate	Not answering
Urban Parents							
Family relationships	23.88	24.16	23.77	22.51	23.27	28.91	12.83
Aspects of personality development	9.27	6.69	5.51	4.46	8.00	5.76	9.32
Non-specified environmental relationships	8.99	15.98	11.41	11.61	11.34	11.63	11.42
Nutrition	7.02	6.32	5.71	6.33	6.09	6.87	4.04
Social conditions	5.62	7.06	4.56	5.63	4.77	2.55	7.03
Sex	5.06	5.20	4.56	5.16	3.82	3.77	3.52
Sleep	4.78	1.49	3.42	3.87	2.51	4.32	2.46
Emotional development	4.78	6.32	8.94	7.03	7.04	4.54	7.21
General health	4.22	1.12				1.22	2.10
Play and fellowship	4.22	4.46	6.28	6.68	4.65	5.87	5.98
Imagination	2.53	2.60	2.66	1.99	1.55	1.00	3.69
School relationships	2.53	3.35	4.37	4.56	4.53	3.43	5.62
Descriptions of social behavior patterns, etc.	1.97	1.49	2.85	2.34	2.98	1.77	3.69
Elimination	1.69	1.12	1.52	2.23	2.38	2.44	1.05
Reproduction	1.41	1.86	1.71	1.41	1.19		2.98
Development in reading, writing, nature study	1.41	2.60	1.52	1.17	1.19	2.44	
Economic group relationships	1.41	1.12	3.23	3.05	1.31	1.55	4.04
Sense organs	1.13	1.12			1.51	2.10	
Church relationships	1.13	1.86		1.76	1.90	1.33	1.23
Other group relationships		1.49					
Genetics and heredity			1.14				
Disease				1.41			1.23
Habit							1.58
Development of esthetic ability							1.23
Rural Parents							
Emotional development	16.13	2.57	3.92	5.15	5.97	5.71	4.45
Family relationships	16.13	20.51	27.46	19.59	19.52	14.29	15.56
Sex	12.90		1.96	1.03	3.18	2.86	
Non-specified environmental relationships	12.90	2.57	7.84	12.88	8.36	17.15	6.67
Aspects of personality development	6.46	20.51	3.92	4.63	8.77	6.86	2.22
Social conditions	6.46	5.12	1.96	4.63	5.97	7.43	2.22
School relationships	6.46	7.69		5.67	6.37	3.43	2.22
Economic group relationships	6.46	2.57	5.88	2.58	2.39	1.14	2.22
Nutrition	3.22	28.20	17.65	14.43	9.56	5.71	11.11
General intelligence	3.22	2.57	3.92		1.60		
Development in reading, writing, nature study	3.22		9.81	3.09	2.79	2.29	11.11
Play and fellowship	3.22		5.88	6.70	5.97	8.57	4.45
Church relationships	3.22	2.57		1.03	3.98	1.14	6.67
Descriptions of social behavior patterns, etc.		5.12	3.92	2.58	2.79	6.86	13.33
Sense organs			1.96	2.06	1.20		
Language development			1.96			1.14	
Other group relationships			1.96				
Disease				3.60	2.39		2.22
Elimination				1.55		2.29	
Sleep				1.55	1.20	2.86	
Motor development				1.55			
General health				1.03		1.14	
Development of esthetic ability				1.03			
Imagination					1.99	3.43	
Reproduction					1.20		
Genetics and heredity						1.14	4.45
Nervous system							2.22
Intellectual development							2.22
Ideation							2.22
Theories or general principles of psychological development							2.22
Instincts and reflexes							2.22

Table XIII shows that it is difficult, without further research, to draw definite conclusions with respect to the urban and rural educational relevancy of base-line categories. However, the basic needs of the urban and rural educational levels are similar, although adjustments must be made as the situation demands.

ANALYSIS OF THE CONTENT OF VARIOUS BASE-LINE CATEGORIES IN TERMS OF PARENTS' QUESTIONS

In studying the 9,936 questions of parents, an attempt has been made to ascertain just what parents wish to know about their children at different ages. The present section attempts to present several phases of the various base-line categories in an age relevancy setting, utilizing the same age groups as in the previous sections but treating them in the natural age order. The selected questions given in the appendix (p.145) are representative of the types of questions asked, although many variations in terminology and phraseology occurred.

Prenatal Period

Few questions were asked concerning the prenatal period, as compared with the larger number at other ages. This fact may not indicate a decreased need or interest on the part of the parent, however. Parents' questions cover most of the important phases of the prenatal period, a fact in itself indicating the scope of information they seek. Concerning prenatal care and development as a whole, they need a great deal of connected, constructive instruction. In many instances questions are so inclusive as to cover all phases of the entire period if fully answered. This may mean (1) that the parent intended to state his questions so as to include the entire period; (2) that he intended to inquire concerning a particular point but did not know how to state the question specifically; or (3) that although aware of specific need, ignorance of the whole period prevented his knowing what to ask.

No question was asked about the signs of pregnancy. Although medical care during confinement seems to be accepted as a matter of course, the value of such care during pregnancy does not seem to be understood. The physical hygiene of pregnancy comprises the greater share of questions.

Numerous questions were asked concerning diet and food for the prenatal period. Information is also needed relative to breast feeding and teeth.

Period of Infancy

The second stage of childhood is that of infancy, covering the period from birth to seventeen months. Parents' needs and wants, as expressed through their questions, begin with the newborn infant and continue through the successive years to the upper age limit. As in the prenatal age group, parents' questions cover most of the important phases of the period.

Extended information is requested on the general care of the newborn infant, whereas the needs for the older infant are centered in specific phases of care, such as bathing, caring for ears and nose, and teething. Information regarding clothing is wanted.

Many phases of nutrition are covered by the questions: breast and artificial feeding, weaning, infant diet, eating habits, regularity of eating, and foods. A comprehensive knowledge of the fundamentals peculiar to each nutritional phase is needed.

Questions about milk show that parents do not know that by the third month human milk is lacking in vitamins B and C and that pasteurization of cow's milk destroys vitamin C. They seem confused as to the values of various kinds of milk.

Requirements, methods, conditions, reactions, and habits form the basis of parents' wants with regard to sleep. Questions on elimination show that this function is inadequately understood. Methods, underlying principles, and a real comprehension of their meaning as related to the training process are needed. Causes for and the prevention and cure of finger and thumb sucking are subjects of inquiry.

Questions concerning the ailments of infancy fail to deal with communicable diseases. Nutritional, congenital, and other types of ailments make up the list. Questions

deal with cause, prevention, and remedy. Health needs are concerned with physical fitness, proper summer foods, the sunbath, cleanliness, and toxins.

Parents also ask questions concerning motor, emotional, and personality development, play, and discipline.

Preschool Period

The problems presented in the preschool period, as evidenced by parents' questions, far outnumber any other single period of childhood. In nutrition, knowledge is wanted concerning the formation of eating habits, the maturation processes essential for self-feeding, and methods of producing good eating habits. In addition, specific information is asked concerning weaning.

The questions indicate that the whole problem of elimination is more than four times as troublesome during the preschool period as at any other period. Enuresis is little understood and is viewed as a physical defect with no thought or knowledge of its psychological aspects. Different parental attitudes are also needed concerning thumb and finger sucking, masturbation, nail biting, etc.

The outstanding needs of parents in relation to rest are: (1) a knowledge of the physical requirements of rest, (2) the importance of regularity and routine in the establishment of regularity, (3) the importance of parental attitudes toward rest, and (4) a comprehension of its psychological aspects.

Parents' knowledge of the scientific significance of sex is so inadequate, so full of sentiment, and so lacking in objective technique that they find it difficult and even impossible to establish satisfactory rapport with their children. Parents' questions indicate that they lack insight into methods and attitudes of sex training and hygiene.

An absence of understanding of the general facts of health and disease essential to parents' coöperation with the various agencies in the maintenance and enforcing of health programs is indicated by the questions. The fact that parents did not inquire about infectious diseases may be explained by the concentrated effort for disease control and better health by various social institutions.

Parents are impatient with their children's efforts in learning to do things. They do not appreciate that dressing, lacing shoes, paper cutting, etc., require muscular development and coördination and that climbing stairs, getting into cupboards, and other similar forms of activity are an essential part of the process of learning. Language development is not understood.

Parents wish to know the basic principles concerning emotional development and need guidance in application of such knowledge. They fail to realize that there may be reasons other than naughtiness causing the difficulty. Some questions indicate a wrong emotional response for which the parent is responsible.

In personality development it is evident that parents fail to comprehend that undesirable traits are symptoms of hidden difficulties; neither do they comprehend the nature of personality. Knowledge is needed pertaining to the whole field of learning. Parents are concerned with guiding aesthetic ability in desirable channels and with selecting books for preschool children.

Family relationships present more problems by far for the preschool age than for any of the other ages. Parents' questions reveal that many types of problems pertaining to the preschool child are related to family relationships.

By their questions, parents show that they are still clinging to the old conception of discipline, that of training for obedience by force. They do not have a constructive viewpoint of discipline, a knowledge of its purpose, and a constructive program.

The questions relating to play and allied topics reveal that parents lack basic facts concerning this aspect of development.

Preadolescent Period

According to the frequency of parents' questions, the period from six to twelve years ranks second in the concern of parents. While the number of problems for this period, as compared with those for the preceding one, remains proportionately the same for the three phases, the questions change within them. One of the most outstanding examples is the large number of questions relating to the topic of reproduction. Parents,

reticent because of the type of their own early training, do not know when to give such information and lack both content and technique for so doing.

The questions indicate that the phenomenon of growth is little understood by parents. Nutrition presents two major problems for this period, eating habits and food. Problems regarding excretory functions continue in the preadolescent age. Parents lack knowledge of facts concerning this function. Questions concerning bed wetting occur also at this age level.

Parents ask for knowledge of nail biting, thumb sucking, and similar acts and seek to understand the causes underlying such behavior. Another point at which parents seek assistance is in achieving a better understanding of the value of work in relation to the preadolescent child and methods of providing for work. Urban parents find such questions especially difficult.

Rest is still a problem at this age, undoubtedly because of faulty early training, the effect of psychological and social factors, and failure to evaluate the importance of regularity in the matter. Better educative measures concerning diseases are sought. Only two questions concerning physical difficulties, constipation and eye-troubles, are found. The greatest concern about health in the preadolescent period is with regard to teeth.

Parents also ask for knowledge concerning intellectual development and seek a better understanding of language and its meaning to the preadolescent. Questions indicate that emotional and personality developments are inadequately understood. Fears of the dark, death, hold-ups, and physical feedings are matters of concern. The sudden appearance of fear and temper tantrums are subjects for queries.

Crushes and bringing friends home appear as problems for the first time. As the questions indicate, some parents worry because they cannot get their children to be particular about their appearance; others are equally concerned because their children are too conscious of appearance. Pugnacious tendencies and collecting traits also concern parents.

Parents indicate a desire for training preadolescents along aesthetic lines, but are themselves unable to give the proper aid. They ask various questions about music. Some parents seem to regard dancing as a sort of religious taboo.

Parents wish to know the best books for the preadolescent. They inquire about illustrations, reference books, fairy tales, magazines, and newspapers. Other reading problems, such as the child's choice of reading material, reading to himself, and reading too much or not enough, are presented. These reading problems suggest at least one reason for the use of so much undesirable literature--parents themselves lack the foundation for making choices.

Parents are naturally concerned about such social behavior problems as the only child, jealousy, stealing, story telling, etc. A study of questions concerning family relationships shows that the family is a prime factor in the development of the child.

An inspection of the long list of personality traits troublesome to parents discloses a great variety of new traits for the preadolescent group as compared with those presented for the preschool group. Exactly 80 per cent of this list are new; the remaining 20 per cent appear in the preschool group and may be said to be maladjustments carried over from that age level.

Playing on the vacant lot with undesirable companions receives its share of queries. Playing with fire is a source of parental anxiety during this age. Parental dominance is evidenced, especially in the choice of playmates.

The idea of discipline as implicit obedience by means of punishment predominates. The questions show need for bringing to parents the true meaning of discipline, together with constructive methods.

Parents ask questions regarding group relationships of children of the preadolescent period. Such moral standards as deception, dishonesty, honesty, and truthfulness result in questions on the part of parents.

Adolescent Period

The fourth period of childhood, adolescence, refers in this study to the years thirteen to twenty-one. The most outstanding

difference between this and the preceding periods is the predominantly social aspect of parents' questions, an indication within itself of the effect of the social forces upon the adolescent. Many of the physical and psychological problems appear to be carried over from the preceding years.

The greatest number of questions concerning the physical aspect pertain to problems of sex and reproduction. Parents are seeking aid for teaching such facts as the father's part in procreation, where babies come from, the physical changes of the adolescent, the explanation of adolescence to the adolescent, etc. The fact that these and other problems have appeared previously at one or more age levels indicates that these situations have not been met adequately. More serious problems pertaining to sex deal with sexual experimentation among adolescents, etc.

Nutritional problems for the adolescent as indicated by the questions are fundamentally the same as those for the preadolescent.

Adults seek help on the problem of work for adolescents, yet they are not aware of its value for their development. Nervousness is the only physical disorder in the adolescent of special concern to parents.

The use of undesirable language continues to be a problem in this period. More knowledge of emotional development and aspects of personality are voiced needs. Boy-girl relationships create problems, and many traits showing maladjustments, such as moodiness, embarrassment, jealousy, etc., are subjects for questions. The automobile is a factor of parental concern in the adolescent period.

Parents are concerned because their children lack the desire to read. They wish their children to appreciate the aesthetic side of life.

Typical of the adolescent period are questions dealing with character building, making decisions, orderliness, petting, self-reliance, and self-assertion.

Adult Period

The previous parts of this section have dealt at length with parents' questions as related to the several specific age groups of development. Since parents are so important in the development of the child, it is not surprising that they are asking for information about themselves and their own behavior. The physical, psychological, and social phases of life share their inquiries, with greatest emphasis upon the social phases.

On the physical side of life, parents' questions reveal interests in sexual problems, nutrition, sense organs, sleep, and disease. In certain food questions, e.g., those relating to cod-liver oil, the parent does not seem to understand the underlying principles either as regards himself or his children.

Questions concerning imagination, individual emotions and personality reactions, reading, and the process of learning represent the psychological basis. Those regarding adult emotions show faulty early training and are a strong index to the existence of many undesirable attitudes found in children. Parents further show by their questions that they are in need of a better understanding of the integral aspects of their own personalities as in displays of affection, cheerfulness, extroversion and introversion, etc.

In general terms, the questions reveal that parents need a wider knowledge of themselves physically and psychologically. Socially there is a paramount need for a more comprehensive understanding of the social changes that have taken and are taking place, and of the effect they have upon the life and conduct of individuals.

Again and again parents express a need for information, knowledge, or education. These needs involve education both for and on the job of parenthood, an index for two future needs of parent education. The one, education for the job of parenthood, may be termed preparental education and would logically become a unit of education in the school curriculum for the adolescent. The other, education on the job, known as parent education, would be an upward extension of our educational system.

SUMMARY, FINDINGS, AND IMPLICATIONS

The purpose of this study was to discover, through an analysis of parents' questions,

what parents need and want to know concerning the rearing of their children.

Four sources of questions were used in this study: questions asked by parents in child study groups, questions obtained from accumulated records, questions asked by parents in the home, and questions obtained from parents of children in nursery schools.

In the child study groups 1,437 parents asked 3,885 questions; 221 parents in homes asked 1,126 questions; 30 parents with children attending preschools asked 89 questions; and by proxy 1,523 parents asked 4,591 questions obtained from accumulated records. A total of 3,211 parents asked 9,691 questions, an average of three questions per parent.

Information concerning the parents was collected from the information card, which included the name, address, educational background, attendance in a study group, and number and ages of children. When received by the investigator, the questions were classified by the same key used in analyzing other parent education materials. Frequencies were found for both questions and parents for the various categories of the classification for each of four sources of questions on both educational and age levels.

The reliability of the classification was determined by the investigator and two other persons, all trained in the use of the key, classifying two sets of parents' questions chosen at random. The first set of twenty-five questions yielded an agreement of 92 per cent; the second set of one hundred questions, 91 per cent.

A summary of the results of the study is given below:

1. The data show that parents' questions are wide and varied in scope. Fifty-three per cent of the total number of questions asked are of a social nature, 28 per cent physical (biological), 18 per cent psychological, and 1 per cent pertain to theories, principles, and methods.
2. Almost 75 per cent of the total number of questions asked are so stated as to refer to children collectively.
3. Parents ask questions pertaining to each period of child development.
4. An analysis shows that many of their questions are symptomatic of unsuspected, preventable causes. Parents' expressed wants, all too frequently, do not coincide with their needs, a fact of which they are not aware.
5. The age relevancy of the base-line categories reveals that age differences are a matter for consideration and that questions of the same type, in many instances even asked in the same wording, are asked for each age level. Each time they reveal practically the same difficulty. Parents have not comprehended that methods and principles used in the early years for solving certain problems are applicable with variations to later years.
6. Parents reveal a negligible comprehension of the prenatal period.
7. The questions cover the most important phases of the period of infancy.
8. The preschool period is characterized by a decided increase in biological needs, with a noticeable increase in both psychological and social developments.
9. According to the frequencies of parent questions, the preadolescent period is second in the concern of parents.
10. While many of the physical and psychological problems occurring in the adolescent period appear to be carried over from preceding years, parents' needs for this period are predominantly social.
11. Generally, the questions on the adult level reveal that parents need a wider knowledge of themselves both biologically and psychologically. Socially there is a need for a more comprehensive understanding of the social changes that have taken and are taking place and their effect upon the life and conduct of individuals.
12. Two hundred fifty-six or 15 per cent of the parents studied received an elementary education of eighth grade

or less. Of the 1,182 parents (70 per cent) who entered high school, 410 or 24 per cent terminated their education at high school graduation. The total number who completed a high school course was 864 or 57 per cent of the entire group asking questions. Of the 554 who entered college, the education of 326 or 19 per cent ended at the close of three years or less; 228 or 14 per cent graduated from a four-year college course. There were 250 or 15 per cent who did not state their education.

13. Parents of all educational levels ask questions about all age levels except the prenatal period.
14. Categories containing needs common to parents of all educational levels are:

    Family relationships
    Non-specified environmental relationships
    Aspects of personality development
    Nutrition
    Sex
    Emotional development
    Social conditions
    Sleep
    Play and fellowship
    School relationships
    Imagination
    Descriptions of social behavior
    Economic relationships
    Development in reading, writing, and nature study

15. The ratios between the number of urban and rural parents asking questions per age level differ widely. While both types of parents are interested in all age levels, the data show that rural parents feel the need for more aid in the prenatal, infant, adolescent, and combination of age levels than do the urban parents. The number of rural parents asking questions about the adolescent far exceed those of the urban parents. More urban parents ask questions about the preadolescent age.

This investigation shows that parents' questions cover a vast scope of needs relevant to all age groups but of importance in varying degrees from one age to another. Certain needs are relevant only to specific ages. Certain categories present needs common to parents of all educational levels. There is a need for common rather than differentiated aims and philosophies for urban and rural groups, with adjustments as occasion demands. Such implications appear of importance to the curriculum maker.

APPENDIX

Selected questions from each category are presented here. In selecting the questions an effort has been made to present those that seem typical. In certain cases, the questions are summarized in a paragraph.

PRENATAL PERIOD

How can one figure the time when the baby is coming?

Is it better to have the baby born in the home or in the hospital?

What is the benefit to mother and child of a physician's care during pregnancy?

When during the period of pregnancy should medical advice be sought?

Just what should be the prenatal care for the infant?

How should the mother care for herself during pregnancy, especially the mother who does her own work?

What is the father's part in the mother's and baby's care before the baby comes?

What is the proper food during the prenatal period?

How can one make the mother realize that the food she eats has so much effect on the child before birth?

What is it during pregnancy that prevents so many mothers from being able to nurse their babies?

What make and type of maternity clothes and corset should the mother wear?

Does the mental condition of the mother during pregnancy affect the development of the child?

Can a child be marked physically from some fear of his mother during pregnancy?

How can the child be influenced during the prenatal period?

What are and where can one get the best books concerning pregnancy?

PERIOD OF INFANCY

Questions concerning the newborn relate to the proper weight of the sexes at birth and inclusive inquiries concerning proper care for the infant. Other definite questions concern some particular phase, such as the bath, ears, or teething, or many phases of the same question, as, for instance, about teething: appetite, care during teething, the structure of the gum tissue, thumb sucking, and the use of the toothbrush.

How long should an infant wear flannels?

What length of time should an infant wear a naval band?

What is the best type of clothing for the baby in the winter?

How the baby shall be fed is probably the most important problem, with questions about both breast and artificial feeding. Questions concerning breast feeding deal with advantages of breast feeding, care of the breasts, duration of nursing, items concerning the nursing mother, and breast refusal. Those of artificial feeding refer to the best method for artificial feeding, bottle feeding and the best way to prepare milk, special care for the bottle baby, management of night feedings, and care of the bottles and nipples.

With respect to infant diet, parents ask questions about the best way of changing the diet to meet maturation requirements, a faulty diet, and the proper diet.

Other nutrition questions follow:

Should the infant be awakened for food?

How can I get my boy, one year, seven months old, to feed himself without urging?

How can regular hours be established for feeding the baby?

How does one give cod-liver oil to a ten-month-old baby, and how much should be given?

Should orange juice be added to the diet of a three-month-old baby?

When should vegetables be added to the baby's diet?

How much milk should a nine-month-old baby have?

Questions concerning rest fall in two divisions, sleep and the nap:

How does one deal with difficulties that arise in putting the baby to sleep?

Should the infant cry while going to sleep?

What should one do when a baby wants to play while going to sleep?

The problems of the daytime nap are far less numerous than those concerned with sleep. Parents ask what the length of the daytime nap should be, whether a child should be forced to nap a definite length of time, and the remedy for too short a nap.

Parents ask questions about complete training of elimination, bowel control, and bladder control. They want to know when to start training, how to establish regularity, how to overcome a refusal of bowel movements, whether the infant should be taken up at night, what is the cause of reverting after complete training, and how to overcome parental impatience during the process.

Questions are asked about three aspects of finger and thumb sucking, cause, prevention, and cure.

Parents' questions about the ailments of infancy fail to include communicable diseases. Nutritional, congenital, and other types of ailments make up the list. Three wants characterize the questions, cause, prevention, and remedy.

What should a mother do when a child of one year insists upon trying to climb the stairs?

What can be done with a child fourteen months old who over and over again pulls the doilies off the dresser?

Anger, fears of all sorts, screaming, striking, stubbornness, and temper are infant behaviors disturbing to parents.

How can one obtain obedience from the baby?

How can I keep my baby away from the stove unless I spank him? I've told him and told him; still he goes to it.

What punishment should be used for a baby who has tantrums?

PRESCHOOL PERIOD

Should children's questions about the baby's origin be answered when they are only three or four years of age?

Isn't the child of preschool age too young to be told about the father's part in reproduction?

If a five-year-old child has not asked any questions about reproduction, should the mother wait for questions?

How can the sex curiosity of the child of preschool age be overcome?

Should a four-year-old's food be mixed up in such fine pieces that he does not need to chew it?

What is the best way to teach a two-year-old to feed herself?

Should one insist on a child one and a half years old feeding himself or wait until the child has the natural desire?

Parents are likewise disturbed over the problems of eating all foods, eating between meals, or eating enough, as well as food dislikes, new foods, overeating, regularity for eating, and food refusal.

What is the proper diet for a child of preschool age?

Other parents are concerned about a diet for muscular development and one that would aid in avoiding constipation.

Should a child of five be allowed to have the bottle?

Twins, eighteen months old, use bottles to go to sleep. Mother gives them five feedings in twenty-four hours. Isn't it better to wean them from the bottle entirely?

Questions refer to three phases of training in connection with excretory

habits: general training, bowel control, and bladder control. The important elements under general training have to do with the best way to train for the toilet, how to train for regularity of toilet habits, how to teach a child to wait on self at the toilet, and whether training for elimination should be left to the maid. How to train applies to both bowel and bladder control. Others ask concerning the frequency of urination to be expected in a preschool child and method of teaching the child to indicate his need of the toilet.

The problem of the preschool child's rest divides itself into two parts, that of sleep and that of the nap. Going to bed and habits of sleep constitute the problems of sleep. Parents question the advisability of reading to the child of preschool age after he has gone to bed. They want to know how to deal with the child who demands a light and are distressed at not knowing how to teach the child to relax when he goes to bed.

Under habits of sleep, parents want information as to where the child should sleep, the amount of sleep required for the preschool child, and how to get him to take enough sleep, to sleep more quietly, and to go to sleep alone.

The daytime nap results in many problems, such as difficulties in going to sleep, the wisdom of omitting the nap during the week-end, reading to the child, refusal to take a nap, and rest without going to sleep.

How can one prevent diseases in the child of preschool age?

How can one properly care for the eyes or teeth of a child of preschool age?

How can a child of preschool age be led to eat the right foods for health?

Should a child of preschool age have adenoids and tonsils removed?

At what age can you expect a child to begin to dress himself?

Should a child two and a half years old be spanked for climbing stairs?

How can one keep an eighteen-month-old child from getting into cupboards?

Should a three-year-old be allowed to run and jump in the house?

Does the child have to be four or five years old to imagine things?

How long can the attention of a four-year-old be expected to stay on one thing?

How can one overcome baby talk in a preschool child?

What can be done with a four-year-old who stutters?

What can be done with a child four and a half years old who wants to throw and hit when angry?

How can crying be stopped in a three-year-old?

What should one do with a five-year-old who screams and kicks when his plans do not work out?

How much can one expect of a three-year-old in the way of controlling temper?

Are temper tantrums in a preschool child normal?

How should one handle the five-year-old who, no matter what happens, always manages to blame the other person and seems assured of being always right herself?

How can initiative be developed in a preschool child?

How can the trait of showing-off be overcome in a preschool child?

What are the proper pictures for a preschool child?

What do you think of a preschool child who is always collecting bits of poetry?

What are the best books for the preschool child?

What are the most suitable stories for the two-year-old?

Should fairy stories be given to the preschool child in the original form?

Are habits formed in preschool years the basis for school success or failure?

How can the preschool child be trained for proper habit formation?

Why does a three-year-old cry when she has to wash her hands and face or change her dress?

What can be done for a four-year-old girl who cries every time she is not with her father or mother, but has perfect confidence in herself and talks freely to anyone when either father or mother is with her?

How can one prevent a four-year-old from insisting on dressing alone when help is offered?

How can one overcome a child's habit of joining a group at play only upon urging?

Should I tell the story of reproduction to my three-year-old who has been told and believes that the doctor sells the babies at the hospital?

My five-year-old son refuses to wear patched overalls. Do I do wrong in insisting that he wear them?

Should we allow our four-year-old boy to choose the clothes he wants to wear?

My three-year-old child dallies with her breakfast. If I take it away she objects, but will not eat it unless she is fed. What shall I do about it?

How can I deal with my preschool child who cries when angry and tells mother she does not like her?

How shall a mother manage a two-year-old who cries for everything?

What can a mother do to overcome the crying of a child two years, seven months at nursery school?

Why is my three-year-old afraid to play outdoors alone? We have never knowingly frightened him, and he plays out when others are with him.

How can I keep my twenty-two-month-old child from developing a jealous complex at the arrival of a baby brother?

What would be the most effective way to teach my preschool child to be responsible for his own particular little tasks?

How can I teach my two and a half year old the proper response toward strangers?

How can my child of three help in the home?

How much should a parent require of a preschool child in home tasks?

In what way can a parent overcome the failure of a preschool child to do home tasks correctly?

My four-year-old son plays roughly with his father but at the least hurt to himself he bawls and is through playing. What is the solution?

How can I teach my three-year-old his responsibility for picking up his toys?

Should a mother select her preschool child's playmates?

What is the best way for a preschool child to play?

What should be given an active preschool child to keep him busy?

How can one get a brother of four and sister of two to want to play at home?

What should be done with a three and a half year old who is never ready to come in and doesn't answer when called?

How can playing while dressing and undressing be overcome?

What can be done with a child two and a half years old who persists in taking other children's things to tease them?

What should be done if a two-year-old refuses to share toys with visitors?

What can be done with children two and a half years old who are constantly taking their toys to pieces?

Of what special value is a nursery school to the preschool child?

Does the attendance of the preschool children in the nursery school spoil a child in any way for kindergarten work?

Parents want to know how to manage the religious training of the preschool child in order that he may obtain broad religious views.

Are there any good books available for the religious education of three-year-old children?

Some parents feel the need for theories and principles but do not know where or how to get the needed information.

PREADOLESCENT PERIOD

At what age should sex education be given to the preadolescent?

If a preadolescent child has asked no questions, should you give information anyway?

How does one give the parts and names of the sexual organs to the preadolescent?

How can one manage the discussion of the origin of life among preadolescent children?

How can one handle the discussion of sex among preadolescent children at school?

How should one correct the stork story to a child of six?

How does one answer a child of six, "Why am I growing up?"

Two aspects of the problem of nutrition appear during the preadolescent period, eating habits and food.

What is the best type of food for the six-year-old?

How are you going to get an eight-year-old boy to drink milk?

In what way can you get an eight-year-old to eat vegetables?

How often should a child of seven need to urinate?

What can be done with a child who continues bed wetting until eight or nine years of age?

Would you do anything about nail biting in a six-year-old which developed right after thumb sucking stopped?

Do children of seven or eight ever have a nervous breakdown?

What daily tasks outside of school work should be expected of a ten-year-old child?

Should boys of nine and ten be expected to do any household tasks?

How early should children between seven and eleven go to bed?

How many hours of sleep should the child of ten have?

What can one do with an eleven-year-old who wants you to come to bed so he can sleep better?

Parents' questions concerning diseases of their children are centered in only two difficulties, constipation and eyes.

How does one go about remedying chronic constipation in a child of eight whose eating habits are badly adjusted?

What should one do with a child of six who never stops to reason that he might be to blame when conflict arises between him and other boys?

For this period, the use of bad language by the child is the only concern in language development.

Should an eleven-year-old child be compelled to do something which he seemingly fears when it seems absurd to the adult?

What is the best way to handle temper tantrums in a girl of six years?

Should children of twelve years be encouraged to bring their friends home?

How can one teach a ten-year-old boy to take greater pride in his appearance?

What advantage is it for a ten-year-old to do her own clothes selecting?

What should one do when a girl eleven years old begins to get too vain?

What is the best thing to do with an eight-year-old who is a chronic knocker?

Why does a child of six continually say "No" when anything is suggested?

Will a boy of eight get over his inclination to fight?

What are the best books for the preadolescent?

What is the value of illustrated books?

Should a child of ten be permitted to confine his leisure reading to fairy tales?

What are some good boys' magazines for a child of ten?

Should a child of six choose his own reading?

Questions in social development pertain to criticism, deliberateness, disrespectfulness, the only child, jealousy, nervousness, putting things away, rebelliousness, snatching, stealing, story telling, talking back, and washing.

What can I do with a seven-year-old girl who, while she receives excellent grades and as far as I can learn is well adjusted in her school life, absolutely rebels every week or two against going to school?

My eight-year-old boy makes me nervous when I am baking cake. He wants to know why I put in egg white only and various questions. What shall I do?

How can I bring up the subject of where babies come from to my seven-year-old daughter who has never asked a question?

Should I tell my six-year-old about sex when she has never asked any questions?

How can I best meet the problem of a precocious interest in boys on the part of my girls eight and nine?

How can I break my boy of eleven of being afraid when he is left alone in the house at night?

Why does my girl of six years show more affection than my boy of eight?

Is it best to insist on preadolescent

girls in the home to have chums among boys?

Should a father be expected to give up tobacco when he does not want his boys ten and twelve to smoke before twenty-one?

Should a mother who likes to smoke do so without her eight-year-old daughter knowing it?

It is my eight-year-old boy's job to place chairs at the table. Although he has been reminded to do it, they are never there when the meal is ready. What can I do to change the situation?

How many tasks should my ten-year-old boy be solely responsible for in the home?

Across the street from our home is a vacant lot where all ages of boys and girls play, some very objectionable. Should I let my nine-year-old boy play there and teach him to discriminate or keep him away for this reason?

How much of an allowance per week should I give my boys of seven and nine years respectively?

My son twelve years old earns at least two dollars and a half a week from his paper route besides banking, etc. Should he be allowed to use this money as he wants?

Should I let my twelve-year-old join a church not his own when most of the scout troup are going in?

My child of nine is very curious about death and seems to think about it very much although there have been none in our family in her experience. How much attention should I pay to this?

How can I present the facts concerning the death of his mother to a son of seven?

How can I get my nine-year-old to do as he is told without repeated commands?

How should I handle my six-year-old child who disobeys?

How should I punish my seven-year-old child for lying?

Parents ask how to provide for an administrator of an estate for a preadolescent. Comedies and movies, crossing intersections, and hopping trains are influences for concern. Other questions concern moral standards made up of such influences as deception, dishonesty, honesty, and truthfulness.

How can one provide wholesome recreation for a boy of seven years?

The problem of the child's desire to play with fire is particularly troublesome during this age. Other behaviors subject to queries are dictatorialness, unfairness, insistence upon having one's own way, hitting, quarrelsomeness, and roughness.

Teaching the child to put away his playthings adds another point of contention between parent and child.

What is the trouble when a child six years old won't keep at anything long or be interested long at a time? He starts to play at one thing, then right away turns to something else?

Lack of a desire for outdoor play, play equipment, and playground supervision are other problems for parents.

How much supervision should be given to the play of a six- or seven-year-old child?

Why are they taking history and geography out of the junior high school and substituting social science and civics?

The question of starting to school, skipping grades, and high school entrance are problems of importance. Parents are further concerned about different attitudes and behaviors connected with the school, such as one child's jealousy of the work of another, the dislike for school, inattention, and idling away time. The type of punishment that should be used in school and the child's failure to make satisfactory progress are further concerns.

What is the best thing to do with a boy of six years who can't take his own part, so that his schoolmates pick on him?

Just what should be the allowance of children covering the years of six to twelve inclusive?

What should an allowance of a preadolescent cover?

Parents question the advisability of allowing a ten-year-old child to attend church and wish to know how to meet inquiries pertaining to death. They want to know what the religious training of a preadolescent should be and how they can accomplish this training. Just what should be expected of the preadolescent as to Sunday School attendance likewise presents its problem.

Are there any good books available for

the religious training of preadolescent children?

Parents question concerning the harmfulness of movies. A like concern is shown about the comics and newspaper reading.

ADOLESCENT PERIOD

Many of the problems which appeared at previous age levels regarding reproduction appear again here, particularly as to how to give children information regarding the father's part in procreation, where babies come from, the physical changes of the adolescent, how to discuss adolescence with the adolescent, dressing and undressing together, the best method for giving sex information, and when to give sex information in preparation for adolescence.

How can one overcome experimentation in sex among adolescents?

Can you give names of books or leaflets on reproduction suitable for any adolescent?

Should one put a book in the hands of an adolescent child expecting him to receive sex information if the parent does not feel qualified to give it?

How can we get books on sex education for the adolescent?

Other problems follow:

Is the physical growth of the adolescent orderly or even?

What are the physical signs of adolescence?

The appetite, the question of diet, and food problems are the most outstanding problems regarding nutrition. Parents are solicitous about the problem of work for their adolescents.

How can one overcome nervousness in the adolescent?

How should the child's health be cared for during adolescence?

How can one obtain emotional stability in the adolescent?

How can one overcome emotional stress in the adolescent?

How can one guide the girl-boy relationships of the adolescent?

Other problems deal with moodiness, embarrassment, sensitiveness, carelessness, adventure, petulance, uncertainty, jealousy, procrastination, and selfishness.

Is there anything that can be done for a girl of sixteen who cares nothing for reading?

Parents desire that their children be able to appreciate the aesthetic side of life, a phase of life in which they themselves have been deprived.

How can one teach the adolescent boy appreciation of music?

What are the definite habits that should be established by the adolescent for the best physical development?

Is the age of fourteen too old to change habits?

How can one overcome the habit in the adolescent of finding fault?

When should my adolescent child be told about sex?

What am I going to do? My boy of thirteen asked if he might take a girl to the basketball game. Should his father have a frank talk with him regarding sex relations?

My boy is fifteen and appears to care nothing for girls. He asks no sex questions, but should he be given sex instruction anyway?

How can I get my high school child to adopt standards of dress within reach of the family purse when friends are more prosperous?

How can I teach my adolescents appropriateness of dress?

Should adolescent girls be allowed to wear overalls all the time during vacation?

How can I give the best care for the health of my adolescent child?

How can I teach my adolescent orderliness?

Problems regarding aspects of personality development found also at previous age levels are keeping the confidence of the child, fighting, impatience, insistence, responsibility, obscene verses learned at school, smoking, and adverse persistence.

How much should my fourteen-year-old boy be required to help his mother with the housework when there are no girls in the family?

How many chores should be required of my adolescent?

Should we parents permit our boy of fourteen to work during vacation?

Should parents choose the friends of adolescent children?

How can we parents best meet the great need for wholesome social contacts for our young people?

Should my adolescent boy have the family car to take his girl for a ride?

How can one efficiently manage adolescent activities?

Should the adolescent be allowed to choose his own companions?

How can adequate recreation be provided for the adolescent?

What should be done with an adolescent girl who is naturally good in mathematics and art but lacks the ambition to continue?

Why do boys and girls of fifteen leave school for work?

How can one keep the high school boy or girl who wants to stop interested in school?

Is one party a week enough for the high school student?

Should a girl be allowed to join a high school sorority?

What should be the weekly allowance of the adolescent?

Should all high school students have an allowance to cover all or part of their expenses?

Should a child of fourteen be allowed to earn his own living?

How can reverence be taught to a group of adolescents who are irreverent in religious services?

What is the best way to give spiritual training to the adolescent?

At what age should girls be allowed to go to parties with boy friends?

Parents question about the brazen hard-boiled attitude, deceitfulness, extremes, firearms, interests, movies, newspaper publicity, and pledges.

Is there any organization to train an adolescent boy for citizenship after he is out of school?

Is the adolescent child a product of preschool age?

ADULT PERIOD

In the psychological aspect of adult life, parents ask about imagination, their emotions, aspects of personality, reading, and learning. Concerning emotions, their questions pertain to emotions in general, inferiority complex, fear in general, fear and crime, fear of the dark, death, dogs, and storms. Parents wish to know if people differ in display of affection and why one feels cheerful in the presence of some people and not in the presence of others. Extroversion and introversion as applied to grown-ups are concepts not fully comprehended, and they do not know how to treat jealousy. Some parents wish to know how to prevent a lack of firmness and dignity, while others are concerned about the building of personality. Sensitiveness, subnormality, moral deficiency, stolidness, sympathy, and temper tantrums are also aspects of personality not sufficiently understood.

Adults are especially interested in knowing whether cod-liver oil is a preventative for colds. Others wish to know what effect a nervous mother has on her child.

How can good literature be obtained for parents?

Parents further inquire whether the mother can be taught to clothe the family, how to teach courteousness to older people, and what the father's part in homemaking is. The meaning of the difference in father ideal and father fixation is troublesome. They question as to how much parents should try to change themselves. Some want to know how training for motherhood is to be given in the family, and others ask if parenthood is a cause for growing up. Health, work outside of the home, and a number of items essential for a 100 per cent parent such as resourcefulness, unselfishness, and spiritual help form many

other questions.

What are the best parents' magazines?

I do not have any magazines in my home that present parent education. What ones are recommended most highly?

Must we not reëducate ourselves before we can make much progress with our children?

Aren't more people talking and thinking about religion than ever before?

Aren't we coming to realize that religion must be a philosophy that fits into our lives and helps us to live?

Such forces as bores, disappointments, encouragement, impertinence, repression, suppression, temptations, and worry each present its particular problem. Others are intangible moral traits such as honesty, moral deficiency, and truthfulness.

Some parents are asking for the best methods and plans to enable them to become intelligent and worthy mothers. They want better training for motherhood and parenthood.